THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appellant(s):	Norsworthy et al.
Appl. No.:	09/882,198
Conf. No.:	8393
Filed:	June 15, 2001
Title:	PET FOOD KIOSK
Art Unit:	3629
Examiner:	Araque, Gerardo Jr.
Docket No.:	115808-460

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANTS' APPEAL BRIEF

Sir:

Appellants submit this Appeal Brief in support of the Notice of Appeal filed on October 29, 2007. This Appeal is taken from the Final Rejections in the Office Action dated June 28, 2007.

I. REAL PARTY IN INTEREST

The real party in interest for the above-identified patent application on Appeal is Nestec, Ltd. by virtue of an Assignment dated January 17, 2003 and recorded at reel 013366, frames 0512-0514 in the United States Patent and Trademark Office.

II. RELATED APPEALS AND INTERFERENCES

Appellants' legal representative and the Assignee of the above-identified patent application do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision with respect to the above-identified Appeal.

III. STATUS OF CLAIMS

Claims 1-24 are pending in the above-identified patent application. Claims 1-24 stand rejected. Therefore, Claims 1-24 are being appealed in this Brief. A copy of the appealed claims is included in the Claims Appendix.

IV. STATUS OF AMENDMENTS

A Non-Final Office Action in response to a Request for Continued Examination was mailed on January 24, 2007. In the Non-Final Office Action, the Examiner entered the previous amendments, but also entered new grounds of rejection under 35 U.S.C. §§102(e), 103, and 112. Appellants filed a response to the Non-Final Office Action on April 11, 2007 with amendments to the claims. A Final Office Action was mailed on June 28, 2007. In the Final Office Action, the Examiner entered the amendments and withdrew the rejections under 35 U.S.C. §112 but maintained the anticipation and obviousness rejections. Appellants filed a response to the Final Office Action on September 20, 2007. An Advisory Action was mailed on October 18, 2007. Appellants filed a Notice of Appeal on October 29, 2007 with respect to the Final Office Action mailed on June 28, 2007. Copies of the Non-Final Office Action mailed on January 24, 2007 and the Final Office Action mailed on June 28, 2007 are attached as Exhibits A and B, respectively, in the Evidence Appendix.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A summary of the invention by way of reference to the specification and/or figures for each of the independent claims is provided as follows:

Independent Claim 1 recites a kiosk (paragraph 10, lines 1-9) configured for selling and manufacturing customized food for a pet (paragraph 8, lines 5-14), said kiosk comprising: a customer interface area (paragraph 9, lines 3-4, 20-22; paragraph 11, lines 1-8) for receiving information regarding the pet (tables, paragraphs 21 and 22); a biological sample analysis and handling area for analyzing the biological information regarding the pet (paragraph 9, lines 3-5, 22-29; paragraph 15, lines 1-4); a computer for receiving information regarding the pet and generating a pet profile (paragraph 9, lines 22-29; paragraph 11, lines 1-3; paragraph 16, lines 1-5); a base product display area (paragraph 9, lines 3-5; paragraph 10, lines 9-13; paragraph 16, lines 5-9); at least one product additive storage area (paragraph 9, lines 3-6; paragraph 10, lines 9-13; paragraph 13, lines 1-6, 8-14) having at least one shelf (paragraph 9, lines 12-17); and an ingredient mixing and customer observation area (paragraph 9, lines 3-7; paragraph 16, lines 9-14).

Independent Claim 12 recites a method comprising: providing the kiosk including at least one of a consumer interaction station (paragraph 9, lines 9-17; paragraph 11, lines 1-8), an analysis station (paragraph 9, lines 9-17) and a workstation (paragraph 9, lines 9-17; paragraph 12, lines 1-17); providing a questionnaire at the consumer interaction station for profiling pets (paragraph 14, lines 10-16); performing an analysis of a biological sample for a pet at the analysis station (paragraph 15, lines 1-4); receiving a customized pet food product formula based on the questionnaire answers and the biological sample at the analysis station (paragraph 15, lines 8-14; paragraph 16, lines 1-5); and preparing a sample of the customized product for the consumer at the workstation (paragraph 17, lines 1-8; paragraph 18, lines 5-8).

Independent Claim 20 recites a method for providing a customized food product for a pet (paragraph 8, lines 5-14) using a kiosk (paragraph 10, lines 1-9), said method comprising: providing the kiosk including at least one of a customer interface area (paragraph 9, lines 3-4, 20-22; paragraph 11, lines 1-8), a biological sample analysis and handling area (paragraph 9, lines 3-5, 22-29; paragraph 15, lines 1-4), a base product storage area (paragraph 9, lines 3-5; paragraph 10, lines 9-13; paragraph 16, lines 5-9), at least one product additive storage area

(paragraph 9, lines 3-6; paragraph 10, lines 9-13; paragraph 13, lines 1-6, 8-14) and an ingredient mixing and customer observation area (paragraph 9, lines 3-7; paragraph 16, lines 9-14); receiving at least one of a biological sample and pet questionnaire information at the customer interface area (paragraph 14, lines 10-13); processing the data from the sample and the questionnaire at the biological sample analysis and handling area (paragraph 15, lines 1-11; paragraph 16, lines 1-5); selecting a kibble from the base product storage area based on the processed data (paragraph 16, lines 5-7, 15-16); mixing a customized additive from ingredients stored in the product additive storage area at the ingredient mixing and customer observation area based on the processed data (paragraph 16, lines 12-18; paragraph 17, lines 1-6); and presenting the selected kibble and the customized additive to the customer at the ingredient mixing and customer observation area (paragraph 17, lines 8-11; paragraph 18, lines 5-8).

Although specification citations are given in accordance with C.F.R. 1.192(c), these reference numerals and citations are merely examples of where support may be found in the specification for the terms used in this section of the Brief. There is no intention to suggest in any way that the terms of the claims are limited to the examples in the specification. As demonstrated by the refcrences numerals and citations, the claims are fully supported by the specification as required by law. However, it is improper under the law to read limitations from the specification into the claims. Pointing out specification support for the claim terminology as is done here to comply with rule 1.192(c) does not in any way limit the scope of the claims to those examples from which they find support. Nor does this exercise provide a mechanism for circumventing the law precluding reading limitations into the claims from thc specification. In short, the references numerals and specification citations are not to be construed as claim limitations or in any way used to limit the scope of the claims.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 1-4 and 6-11 are rejected under 35 U.S.C. §102(e) as being unpatentable over U.S. Patent No. 6,416,270 B1 to Steury et al. ("*Steury*"). A copy of *Steury* is attached herewith as Exhibit C in the Evidence Appendix.

2. Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Steury*.

3. Claims 12-15 and 17-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,681,717 B2 to Burghardi ("*Burghardi*"). A copy of *Burghardi* is attached herewith as Exhibit D in the Evidence Appendix.

4. Claim 16 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Burghardi* in view of *Steury*.

VII. ARGUMENT

A. LEGAL STANDARDS

1. Anticipation under 35 U.S.C. §102

"Under 35 U.S.C. §102, anticipation requires that each and every element of the claimed invention be disclosed in the prior art ..." *Akzo NV v. U.S. International Trade Commission,* 1 U.S.P.Q.2d 1241, 1245 (Fed. Cir. 1986). Moreover, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros v. Union Oil of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

Federal Circuit decisions have repeatedly emphasized the notion that anticipation cannot be found where less than all elements of a claimed invention are set forth in a reference. *See, e.g. Transclean Corp. v. Bridgewood Services, Inc.*, 290 F.3d 1364 (Fed. Cir. 2002). In this regard, a reference disclosing "substantially the same thing" is not enough to anticipate. *Jamesbury Corp. v. Litton Indust. Prod., Inc.*, 756 F.2d 1556, 1560 (Fed. Cir. 1985). A reference must clearly disclose each and every limitation of the claimed invention before anticipation may be found.

2. Obviousness under 35 U.S.C. §103

The Federal Circuit has held that the legal determination of an obviousness rejection under 35 U.S.C. § 103 is:

> whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made...The foundational facts for the prima facie case of obviousness are: (1) the scope and content of the prior art; (2) the difference between the prior art and the claimed invention; and (3) the level of ordinary skill in the art...Moreover, objective indicia such as commercial success and long felt need are relevant to the determination of obviousness...Thus, each obviousness determination rests on its own facts.

In re Mayne, 41 U.S.P.Q. 2d 1451, 1453 (Fed. Cir. 1997).

In making this determination, the Patent Office has the initial burden of proving a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q. 2d 1955, 1956 (Fed.

Cir. 1993). This burden may only be overcome "by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings." *In re Fine*, 837 F.2d 1071, 1074, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). "If the examination at the initial stage does not produce a prima facie case of unpatentability, then without more the applicant is entitled to grant of the patent." *In re Oetiker*, 24 U.S.P.Q. 2d 1443, 1444 (Fed. Cir. 1992).

Moreover, the Patent Office must provide explicit reasons why the claimed invention is obvious in view of the prior art. The Supreme Court has emphasized that when formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art clements in the manner claimed. *KSR v. Teleflex*, 127 S. Ct. 1727 (2007).

Of course, references must be considered as a whole and those portions teaching against or away from the claimed invention must be considered. *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve Inc.*, 796 F.2d 443 (Fed. Cir. 1986). "A prior art reference may be considered to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the Applicant." *Monarch Knitting Machinery Corp. v. Fukuhara Industrial Trading Co., Ltd.*, 139 F.3d 1009 (Fed. Cir. 1998), quoting, *In re Gurley*, 27 F.3d 551 (Fed. Cir. 1994).

B. THE CLAIMED INVENTION

Independent Claim 1 recites, in part, a kiosk configured for selling and manufacturing customized food for a pet. The kiosk comprises a customer interface area for receiving information regarding the pet, a biological sample analysis and handling area for analyzing the biological information regarding the pet, a computer for receiving information regarding the pet and generating a pet profile, a base product display area, at least one product additive storage area having at least one shelf, and an ingredient mixing and customer observation area.

Independent Claim 12 is directed to a method for providing a customized food product for a pet. A kiosk is provided including at least one of a consumer interaction station, an analysis station and a workstation. A questionnairc is provided at the consumer interaction station for profiling pets. An analysis of a biological sample for a pet is performed at the analysis station.

A customized pet food product formula is received based on the questionnaire answers and the biological sample at the analysis station. A sample of the customized product is provided for the consumer at the workstation.

Independent Claim 20 recites, in part, a method for providing a customized food product for a pet. A kiosk is provided including at least one of a customer interface area, a biological sample analysis and handling area, a base product storage area, at least one product additive storage area and an ingredient mixing and customer observation area. At least one of a biological sample and pet questionnaire information are received at the customer interface area. The data from the sample and the questionnaire is processed at the biological sample analysis and handling area. A kibble is selected from the base product storage area based on the processed data, and a customized additive is mixed from ingredients stored in the product additive storage area at the ingredient mixing and customer observation area based on the processed data. The selected kibble and the customized additive are presented to the customer at the ingredient mixing and customer observation area.

C. THE REJECTION OF CLAIMS 1-4 AND 6-11 UNDER 35 U.S.C. §102(e) SHOULD BE REVERSED BECAUSE *STEURY* FAILS TO DISCLOSE OR SUGGEST EVERY ELEMENT OF THE CLAIMED INVENTION

Appellants respectfully submit that the cited reference fails to disclose or suggest every element of the presently pending claims. Independent Claim 1 recites, in part, a kiosk configured for selling and manufacturing customized food for a pet that includes a customer interface area for receiving information regarding the pet and a computer for receiving information regarding the pet and generating a pet profile. The kiosk of independent Claim 1 also includes areas for biological sampling and handling and ingredient mixing. In contrast, *Steury* fails to disclose or suggest every element of independent Claim 1 for at least the reasons set forth below.

1. *Steury* fails to disclose a kiosk capable of receiving information regarding a pet and generating a pet profile based on the information

Independent Claim 1 requires, in part, a kiosk for selling and manufacturing customized food for a pet that includes a customer interface area for receiving information regarding a pet

and a computer for receiving information regarding the pet and generating a pet profile. The information received regarding the pet is used to generate a unique pet profile that is in turn used to create a customized pet food. In contrast, *Steury* is entirely directed to a kiosk for dispensing and accepting returns of stored items. See, *Steury*, column 1, lines 52-58. Nowhere does *Steury* disclose receiving specific information from the consumer regarding a pet and generating a pet profile based on the unique data received from the consumer. In fact, the only interactive aspect of *Steury* is responding to and confirming user entered selections and personal identification numbers (pin's). See, *Steury*, column 2, lines 6-9. The user pin's and selections regarding storage and inventory data are preprogrammed into the digital controller that monitors user receipts and returns. See, *Steury*, column 2, lines 56-58. Thus, *Steury* does not disclose or suggest receiving unique information regarding a pet and generating a pet profile from that unique information as required, in part, by the present invention.

The Examiner states that "[i]f the prior art structure is capable of performing the intended use, then it meets the claim." See, Final Office Action dated June 28, 2007, page 11, lines 6-7. However, because the information received in *Steury* is preprogrammed into the digital controller, the kiosk of *Steury* is not capable of performing the intended use of the present invention: selling and manufacturing a customized pet food product based on a pet profile generated in response to the receipt of unique information regarding a pet. The Examiner cites the interactive user data entry panel in *Steury* as support for "a customer interface area for receiving information regarding the pet." See, Final Office Action, page 2, lines 14-15. However, the data entry panel in *Steury* merely "senses user actions to dispense or to return specific items from and to inventory." See, *Steury*, column 4, lines 39-41. Moreover, as discussed previously, the storage and inventory data is preprogrammed into the digital controller. Thus, the kiosk of *Steury* is merely capable of accepting user selections regarding preprogrammed data; it is not capable of accepting unique information regarding a specific pet.

Moreover, *Steury* does not disclose or suggest a computer for generating a pet profile based on the information received regarding a pet in accordance with the present claims. The present invention recites, in part, a kiosk that includes a computer for receiving information regarding a pet and generating a pet profile. The information regarding the pet is unique to the pet and includes data such as the gender and age of the pet, whether the pet has been spayed or neutered, the activity level and body condition of the pet, and the flavor preference of the pet.

See, Specification, paragraph 21. The pet profile is generated based, in part, on the information received regarding the pet. See, Specification, paragraph 14, lines 10-17; paragraph 16, lines 1-2. Moreover, "[e]ach profile has a unique identifying code and contains the specific customized food product and feeding instructions recommended for the specific pet." See, Specification, paragraph 16, lines 2-5. Thus the pet profile generated by the present invention is based on unique information regarding a pet that cannot be preprogrammed into a computer. In contrast, *Steury* discloses a user interface that merely responds to user actions regarding preprogrammed instructions and selection sequences. See, *Steury*, column 4, lines 39-41, 59-61.

As such, Appellants respectfully submit that *Steury* fails to disclose or suggest a kiosk capable of receiving unique information regarding a pet and generating a pet profile from that unique information as required, in part, by independent Claim 1.

2. *Steury* also fails to disclose or suggest a kiosk with biological sampling and handling and ingredient mixing areas

Independent Claim 1 recites, in part, a kiosk configured for selling and manufacturing customized food for a pet that includes a biological sampling and handling area for analyzing the biological information regarding the pet and an ingredient mixing area. The biological information is analyzed through a computer or by an individual at the kiosk. See, Specification, paragraph 9, lines 24-29; paragraph 15, lines 1-4. The ingredient mixing area is used by an individual to mix the ingredients provided for the custom pet food product. See, Specification, paragraph 18, lines 5-8. In contrast, *Steury* is entirely directed to a self-service kiosk for dispensing and accepting returns of stored items. See, *Steury*, column 1, lines 52-58. As discussed previously, *Steury* does not disclose a computer for analyzing unique, non pre-programmable information. Thus, the computer disclosed in *Steury* is not capable of analyzing biological sample information from a pet.

Contrary to the Examiner's assertion, see Final Office Action dated June 28, 2007, page 2, lines 16-19; page 3, lines 3-5, *Steury* also fails to disclose a kiosk capable of providing areas sufficient for an individual to analyze biological information regarding a pet and mix ingredients for a custom pet food product. The Examiner cites the display case described in *Steury* as support for the claimed biological sampling and handling and ingredient mixing areas. See,

Final Office Action dated June 28, 2007, page 3, lines 3-5. However, the display case disclosed in *Steury* is used only to display products in inventory, and its size depends on the type of merchandise and the frequency with which such merchandise will be re-supplied. See, *Steury*, column 4, lines 29-30, 35-37. *Steury* does not disclose or suggest additional areas in the display case with sufficient room to analyze biological samples of pets or mix ingredients for a custom pet food product. In fact, *Steury* is specifically directed to a kiosk for dispensing and accepting returns of stored items. See, *Steury*, column 1, lines 52-58. Thus, *Steury* fails to disclose or suggest a display case with additional areas for an individual to analyze biological samples and mix ingredients for a custom pet food product.

Moreover, *Steury* does not disclose or suggest a kiosk configured for selling and manufacturing customized food for a pet that includes areas for biological sampling and handling and mixing ingredients. *Steury* specifically states that its kiosk, "[w]ith the exception of periodic maintenance and re-supply of inventory, . . . is fully automated and does not require any on-site staff." See, *Steury*, column 3, lines 46-48. Furthermore, the kiosk of *Steury* is designed only for dispensing and accepting returns of stored items. See, *Steury*, column 1, lines 52-58. Unlike *Steury*, the present invention is directed to a kiosk operated by an individual with areas for analyzing biological samples of pets and mixing ingredients for a custom pet food product. See, Specification, paragraph 9, lines 4-7; paragraph 13, line 1. Because the ingredients in the custom pet food product are based, in part, on the information obtained from analyzing the biological sample of a specific pet, the custom pet food product is not a stored item and must be prepared at the kiosk in the ingredient mixing area with the assistance of a kiosk operator. See, Specification, paragraph 16, lines 1-18; paragraph 17, lines 1-6. Therefore *Steury* does not disclose or suggest a kiosk configured for selling and manufacturing customized food for a pet with the assistance of a kiosk operator but rather a self-service kiosk capable of dispensing and returning stored items only.

In sum, the kiosk of *Steury* fails to disclose each and every element of the present invention because it is not capable of receiving unique, non-preprogrammed information regarding a pet and therefore cannot be used to manufacture and sell a customized pet food product as required, in part, by the present claims. Instead of teaching a kiosk that includes (i) a customer interface area for receiving information regarding a pet; (ii) a biological sample handling and analysis area for analyzing the biological information regarding the pet; (iii) a

computer for generating a pet profile based on the information regarding the pet; and (iv) an ingredient mixing area to prepare the customized pet food product as required, in part, by the present claims, *Steury* teaches a kiosk that includes a user interface that merely responds to user actions to dispense or return stored items. The kiosk of *Steury* merely allows a user to follow preprogrammed instructions or selection sequences and cannot accept or process unique information, such as information regarding the pet or a biological sample from the pet. Thus, *Steury* fails to disclose each and every element of the present claims.

D. THE REJECTION OF CLAIM 5 UNDER 35 U.S.C. §103(a) TO *STEURY* IS IMPROPER IN VIEW OF THE PATENTABILITY OF INDEPENDENT CLAIM 1

Claim 5 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Steury*. Appellants respectfully submit that the patentability of Claim 1 over *Steury* as discussed previously renders moot the obviousness rejection of Claim 5 that depends from Claim 1. In this regard, the cited art fails to teach or suggest the elements of Claim 5 in combination with the novel elements of Claim 1.

For example, the Examiner alleges that *Steury* discloses a kiosk that is further configured to be locked and, although *Steury* does not disclose covering the kiosk, "it is old and well known . . . to provide some covering for portable kiosks." See, Final Office Action dated June 28, 2007, page 4, lines 18-21. However, as discussed previously, *Steury* fails to disclose a kiosk configured for selling and manufacturing customized food for a pet as required, in part, by Claim 5. Therefore, *Steury* does not teach or suggest the required elements of Claim 5 that depends from independent Claim 1.

Accordingly, Appellants respectfully submit that Claim 5 is novel, nonobvious and distinguishable from the cited references and is in condition for allowance.

E. THE REJECTION OF CLAIMS 12-15 AND 17-24 UNDER 35 U.S.C. §103(a) TO *BURGHARDI* SHOULD BE REVERSED BECAUSE THE EXAMINER HAS NOT ESTABLISHED A *PRIMA FACIE* CASE OF OBVIOUSNESS

Appellants respectfully submit that the cited reference fails to disclose or suggest every element of the presently pending claims. Independent Claim 12 recites, in part, a method that

includes: (i) providing a kiosk including at least one of a consumer interaction station, an analysis station and a workstation; (ii) providing a questionnaire at the consumer interaction station for profiling pets; (iii) performing an analysis of a biological sample for a pet at the analysis station; and (iv) receiving a customized pet food product formula based on the questionnaire answers and the biological sample at the analysis station.

Similarly, independent Claim 20 recites, in part, a method for providing a customized food product for a pet using a kiosk. The method of independent Claim 20 includes receiving at least one of a biological sample and pet questionnaire information at a customer interface area and processing the data from the sample and the questionnaire at a biological sample analysis and handling area. In contrast, *Burghardi* fails to disclose or suggest every element of independent Claims 12 and 20 for at least the reasons set forth below.

1. *Burghardi* fails to disclose or suggest selling or manufacturing a customized food product for a pet using a kiosk

Independent Claims 12 and 20 recite, in part, a method for providing a customized food product for a pet using a kiosk. The kiosk is used to receive information from a consumer regarding a pet and to receive and analyze a biological sample from a pet. The information obtained from either the consumer or the biological sample is used to generate a unique pet profile that is in turn used to create a customized pet food. In contrast, *Burghardi* is entirely directed to a computerized system for determining a customized animal food product. See, *Burghardi*, column 1, lines 1-3. Nowhere does *Burghardi* disclose using a kiosk to receive specific information from the consumer or a biological sample and creating a customized pet food product at the kiosk based on the unique data regarding the pet. In fact, the only locations *Burghardi* discloses for storing or mixing the ingredients of the customized feed are a farm and a supplier's mill. See, *Burghardi*, column 2, lines 46-53; column 3, lines 26-29. Thus, *Burghardi* does not disclose or suggest selling or manufacturing a customized pet food product using a kiosk as required, in part, by the present invention.

The Examiner relies upon the disclosure of workstations in *Burghardi* as support for the requirement of a kiosk. See, Non-Final Office Action dated January 24, 2007, page 5, lines 18-20; page 7, lines 16-19. However, the workstation disclosed in *Burghardi* is only used to store

the processor that analyzes the data regarding the animal. See, *Burghardi*, column 3, lines 29-34. *Burghardi* does not disclose that the workstation may be used as a kiosk to receive specific information from the consumer or a biological sample and create a customized pet food product at the kiosk based on the unique data regarding the pet. Moreover, as discussed previously, the only locations for storing the ingredients required to prepare the customized feed product are a farm and a supplier's mill. See, *Burghardi*, column 2, lines 46-53; column 3, lines 26-29. Thus, the disclosure of workstations in *Burghardi* is not sufficient to meet the claimed requirement of a method of manufacturing and selling a customized pet food product using a kiosk.

Moreover, *Burghardi* does not disclose or suggest a method for producing a customized food product for a pet. The present invention recites, in part, a method of providing a customized food product for a pet based on information provided by a customer or obtained by an analysis of a biological sample of the pet. The information regarding the pet is unique to the pet and includes data such as the gender and age of the pet, whether the pet has been spayed or neutered, the activity level and body condition of the pet, and the flavor preference of the pet. See, Specification, paragraph 21. In contrast, *Burghardi* is entirely directed to providing a customized feed for animals such as farm livestock, poultry, fish and crustaceans. See, *Burghardi*, column 2, lines 12-14. The purpose of the customized feed disclosed in *Burghardi* is to obtain a desired amount and quality of product produced by the animal. See, *Burghardi*, column 1, lines 23-28, 37-39; column 3, lines 5-7. Unlike the customized feed product disclosed in *Burghardi*, the customized food product of the present claims is used to accommodate the dietary needs of an individual pet. See, Specification, paragraph 2, lines 16-24. The information on which the customized feed of *Burghardi* is based includes the genotype of the animal, the desired production level, the desired final condition of the animal, the form of feed, the current production level, and the current condition or weight of the animal. Thus, *Burghardi* is directed wholly to a customized feed product for an animal that produces food or dairy products, rather than a household pet. See, *Burghardi*, column 1, lines 23-28, 37-39; column 3, lines 5-7; tables 21 and 22. As such, Appellants respectfully submit that *Burghardi* fails to disclose or suggest a method of providing a customized food product for a pet as required, in part, by independent Claims 12 and 20.

2. *Burghardi* also fails to disclose or suggest manufacturing a customized food product for a pet based on data obtained from a questionnaire or biological sample

Independent Claim 12 recites, in part, a method for providing a customized food product for a pet based on answers to a questionnaire regarding the pet and analysis of a biological sample of the pet. Similarly, independent Claim 20 recites, in part, a method for providing a customized food product for a pet based on information obtained from at least one of a biological sample of the pet and a questionnaire regarding the pet. The questionnaire and biological sample are used to determine the dietary needs of an individual pet and a customized pet food product that can accommodate those needs. See, Specification, paragraph 2, lines 16-24. In contrast, *Burghardi* is entirely directed to a computerized system for determining a customized animal food product. See, *Burghardi*, column 1, lines 1-3. Nowhere does *Burghardi* disclose receiving a questionnaire or biological sample of a pet and analyzing that information to create a customized pet food product. In fact, the information used to determine the customized feed of *Burghardi* is "generally related to factors representative of animal productivity," rather than the dietary needs of an individual pet that may be determined from a questionnaire or biological sample analysis. See, *Burghardi*, column 2, lines 18-20. Thus *Burghardi* does not disclose or suggest selling or manufacturing a customized food product for a pet based on data obtained from a questionnaire or biological sample of the pet.

The Examiner cites various examples of the animal data used to generate a profile and determine a customized feed in *Burghardi* as support for the claimed elements of receiving a biological sample or questionnaire and utilizing the information obtained from the questionnaire and biological sample to create a customized food product. See, Non-Final Office Action dated January 24, 2007, page 5, lines 21-22; page 6, lines 1-5; page 7, lines 20-22. However, as discussed previously, the information used to determine the customized feed of *Burghardi* involves factors related to animal productivity. See, *Burghardi*, column 2, lines 18-20. In contrast, the data obtained from the questionnaire and biological sample of the present invention is related to the dietary needs and health of an individual pet. Moreover, *Burghardi* only discloses that the data used to create its customized feed is input into a computer system by a user. See, *Burghardi*, column 5, lines 9-11, 60-62. *Burghardi* does not disclose obtaining the information utilizing a questionnaire or biological sample. Thus, Appellants respectfully submit

that *Burghardi* does not disclose or suggest manufacturing a customized food product for a pet based on information obtained from a questionnaire or biological sample.

In sum, the computerized system of *Burghardi* fails to disclose each and every element of the present invention because it does not suggest or disclose manufacturing a customized food product for a pet at a kiosk based on information obtained from a questionnaire or biological sample of the pet. Instead of teaching ways to use a kiosk to receive and analyze specific information from a questionnaire or a biological sample of a pet and create a customized pet food product at the kiosk based on such information as required, in part, by the present claims, *Burghardi* teaches a method of creating a customized feed for a farm or livestock animal based on animal productivity data input into a computer system. *Burghardi* does not disclose or suggest utilizing a kiosk to obtain dietary information from a questionnaire or biological sample of a pet and creating a customized pet food product based on such dietary information. Thus, *Burghardi* fails to disclose each and every element of the present claims.

F. THE REJECTION OF CLAIM 16 UNDER 35 U.S.C. §103(a) TO *BURGHARDI* AND *STEURY* IS IMPROPER IN VIEW OF THE PATENTABILITY OF INDEPENDENT CLAIM 1

Claim 16 is rejected under 35 U.S.C. §103(a) as being unpatentable over *Burghardi* and *Steury*. Appellants respectfully submit that the patentability of Claim 12 over *Burghardi* as discussed previously renders moot the obviousness rejection of Claim 16 that depends from Claim 12. In this regard, the cited art fails to teach or suggest the elements of Claim 16 in combination with the novel elements of Claim 12.

For example, Claim 16 requires affixing graphics panels to at least one of the consumer interaction station, the analysis station, and the workstation. The Examiner asserts that *Steury* teaches a kiosk with "faceplates containing printed graphics, icons, and a display in order to instruct the user on how to use the kiosk." See, Non-Final Office Action dated January 24, 2007, page 10, lines 16-19. The Examiner alleges that it would be "obvious to one having ordinary skill in the art at the time of the invention to modify *Burghardi* in view of the teachings of *Steury* to provide graphics on a kiosk station." See, Non-Final Office Action dated January 24, 2007, page 10, lines 20-21; page 11, line 1. However, as discussed previously, both *Steury* and

Burghardi fail to disclose manufacturing and selling a customized pet food product based on information obtained from a questionnaire or analysis of biological sample of the pet. Thus, for reasons discussed above, the cited references, even if combinable, fail to teach or suggest the elements of Claim 16 in combination with the novel elements of Claim 12. Therefore, *Steury* does not cure the deficiencies of *Burghardi*, and even if the cited references are combinable, they do not teach or suggest the required elements of Claim 16 that depends from independent Claim 12.

Accordingly, Appellants respectfully submit that Claim 16 is novel, nonobvious and distinguishable from the cited references and is in condition for allowance.

VIII. CONCLUSION

Appellants respectfully submit that the Examiner has failed to establish anticipation under 35 U.S.C. §102 and a *prima facie* case of obviousness under 35 U.S.C. §103 with respect to the rejection of Claims 1-24. Accordingly, Appellants respectfully submit that the anticipation and obviousness rejections are erroneous in law and in fact and should therefore be reversed by this Board.

The Director is authorized to charge $500 for the Appeal Brief and any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 115808-460 on the account statement.

Respectfully submitted,

BELL, BOYD & LLOYD LLP

BY _____

Robert M. Barrett
Reg. No. 30,142
Customer No. 29157

Dated: December 21, 2007

CLAIMS APPENDIX

PENDING CLAIMS ON APPEAL OF U.S. PATENT APPLICATION SERIAL NO. 09/882,198

1. A kiosk configured for selling and manufacturing customized food for a pet, said kiosk comprising:

a customer interface area for receiving information regarding the pet;

a biological sample analysis and handling area for analyzing the biological information regarding the pet;

a computer for receiving information regarding the pet and generating a pet profile;

a base product display area;

at least one product additive storage area having at least one shelf; and

an ingredient mixing and customer observation area.

2. A kiosk according to Claim 1 whercin said biological sample analysis and handling area is configured with a biological sample disposal area.

3. A kiosk according to Claim 1 wherein said kiosk is further configured to be expanded or contracted.

4. A kiosk according to Claim 1 wherein said kiosk is further configured to be portable.

5. A kiosk according to Claim 1 wherein said kiosk is further configured to be covered and locked.

6. A kiosk according to Claim 1 further comprising a base product storage area.

7. A kiosk according to Claim 1 wherein said kiosk is constructed from at least one of wire shelving, stainless steel supports, plastic bins, and laminated wood and stainless steel shelving.

8. A kiosk according to Claim 1 wherein said at least one product additive storage area is stocked with at least one of a dry inventory and a liquid inventory.

9. A kiosk according to Claim 1 wherein said kiosk comprises three separate units, including at least one of a consumer interaction station, an analysis station, and a workstation.

10. A kiosk according to Claim 1 further comprising a computer configured to store at least one custom pet food for an individual pet profile.

11. A kiosk according to Claim 1 further comprising graphics panels to advertise said kiosk and the functionality of said kiosk.

12. A method comprising:

providing the kiosk including at least one of a consumer interaction station, an analysis station and a workstation;

providing a questionnaire at the consumer interaction station for profiling pets;

performing an analysis of a biological sample for a pet at the analysis station;

receiving a customized pet food product formula based on the questionnaire answers and the biological sample at the analysis station; and

preparing a sample of the customized product for the consumer at the workstation.

13. A method according to Claim 12 further comprising storing results of the questionnaire and the biological sample analysis as a pet profile at the analysis station.

14. A method according to Claim 13 further comprising using the pet profile stored at the analysis station to prepare additional portions of the product additive at the workstation for repeat consumers.

15. A method according to Claim 12 wherein preparing a sample of the customized product at the workstation further comprises preparing a custom product additive to be added to a base formula.

16. A method according to Claim 12 further comprising affixing graphics panels to at least one of thc consumer interaction station, the analysis station, and the workstation.

17. A method according to Claim 12 wherein preparing a sample of the customized product comprises adding at least one of a dry product additive and a liquid additive to the base formula.

18. A method according to Claim 12 wherein receiving a customized pet food product formula further comprises modeling questionnaire responses and the analysis of the biological sample.

19. A method according to Claim 12 wherein performing an analysis of a biological sample for a pet comprises performing the analysis using a computer located at the analysis station.

20. A method for providing a customized food product for a pet using a kiosk, said method comprising:

providing the kiosk including at least one of a customer interface area, a biological sample analysis and handling area, a base product storage area, at least one product additive storage area and an ingredient mixing and customer observation area;

receiving at least one of a biological sample and pet questionnaire information at the customer interface area;

processing the data from the sample and the questionnaire at the biological sample analysis and handling area;

selecting a kibble from the base product storage arca based on the processed data;

mixing a customized additive from ingredients stored in the product additive storage area at the ingredient mixing and customer observation area based on the processed data; and

presenting the selected kibble and the customized additive to the customer at the ingredient mixing and customer observation area.

21. A method according to Claim 20 wherein processing the data from the sample and the questionnaire further comprises generating feeding instructions and package labels.

22. A method according to Claim 20 wherein presenting the selected kibble and the customized additive further comprises providing feeding instructions and package labels to the customer.

23. A method according to Claim 20 wherein presenting the selected kibble and the customized additive further comprises presenting the customer with a customized measuring scoop for the kibble and a custom-selected spoon for the customized additive.

24. A method according to Claim 20 wherein presenting the selected kibble and the customized additive further comprises presenting the customer with recommendations concerning frequency and conditions of future biological sample analyses and profile updates for their pet.

EVIDENCE APPENDIX

EXHIBIT A: Non-Final Office Action dated January 24, 2007

EXHIBIT B: Final Office Action dated June 28, 2007

EXHIBIT C: United States Patent No. 6,416,270 B1 to Steury et al. ("*Steury*"), cited by the Examiner in the Final Office Action dated June 28, 2007

EXHIBIT D: United States Patent No. 6,681,717 B2 to Burghardi ("*Burghardi*"), cited by the Examiner in the Final Office Action dated June 28, 2007

RELATED PROCEEDINGS APPENDIX

None.

EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,198	06/15/2001	Gregory J. Norsworthy	115808-460	8393

29157 7590 01/24/2007

BELL, BOYD & LLOYD LLP
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
ARAQUE JR, GERARDO	
ART UNIT	PAPER NUMBER
3629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/882,198	NORSWORTHY ET AL.	
	Examiner	Art Unit	
	Gerardo Araque Jr.	3629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 March 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/17/01; 6/9/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claims 12 – 19** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. **Claim 12** is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: a method step for marketing a customized food product for a pet using a kiosk.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1 – 4 and 6 – 11** are rejected under 35 U.S.C. 102(e) as being anticipated by **Steury et al. (US Patent 6,416,270 B1)**.

6. In regards to **claim 1**, **Steury** discloses a kiosk configured for selling and manufacturing customized food for a pet, said kiosk comprising:

a customer interface area for receiving information regarding the pet **(Column 4 Lines 38 – 39)**;

a biological sample analysis and handling area for analyzing the biological information regarding the pet **(Column 4 Lines 17 – 19; moreover, each storage unit, tray, as well as the top of the kiosk is capable of providing an area for an individual to work on)**;

a computer for receiving information regarding the pet and generating a pet profile **(Column 3 Lines 60 – 62; Column 4 Lines 38 – 39)**;

a base product display area **(Column 4 Lines 16 – 18)**;

at least one product additive storage area having at least one shelf **(Column 2 Lines 14 – 18)**; and

an ingredient mixing and customer observation area **(Column 4 Lines 17 – 19; moreover, each storage unit, tray, as well as the top of the kiosk is capable of providing an area for an individual to work on)**.

7. In regards to **claim 2**, **Steury** discloses wherein said biological sample analysis and handling area is configured with a biological sample disposal area **(Column 2 Lines 1 – 2, 62 – 65; wherein the kiosk is capable or receiving items from a customer and held, which would then be disposed of, if necessary, by a personnel)**.

8. In regards to **claim 3**, **Steury** discloses wherein said kiosk is further configured to be expanded or contracted **(Column 3 Lines 56 – 57)**.

9. In regards to **claim 4**, **Steury** discloses wherein said kiosk is further configured to be portable **(Claim 1 Part A)**.

10. In regards to **claim 6**, **Steury** discloses further comprising a base product storage area **(Column 2 Lines 14 – 18)**.

11. In regards to **claim 7**, **Steury** discloses wherein said kiosk is constructed from at least one of wire shelving, stainless steel supports, plastic bins, and laminated wood and stainless steel shelving **(Column 3 Lines 1 – 7)**.

12. In regards to **claim 8**, **Steury** discloses wherein said at least one product additive storage area is stocked with at least one of a dry inventory and a liquid inventory **(Column 5 Lines 19 – 21)**.

13. In regards to **claim 9**, **Steury** discloses wherein said kiosk comprises three separate units, including at least one of a consumer interaction station **(Column 2 Lines 4 Lines 38 – 39)**, an analysis station **(Column 2 Lines 6 – 9)**, and a workstation **(Column 2 Lines 31 – 34)**.

14. In regards to **claim 10**, **Steury** discloses further comprising a computer configured to store at least one custom pet food for an individual pet profile **(Column 3 Lines 60 – 62; Column 5 Lines 58 – 64)**.

15. In regards to **claim 11**, **Steury** discloses further comprising graphics panels to advertise said kiosk and the functionality of said kiosk **(Column 4 Lines 47 – 57)**.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Steury et al. (US Patent 6,416,270 B1)**.

18. In regards to **claim 5, Steury** discloses wherein said kiosk is further configured to be locked **(Column 4 Lines 21 – 22)**.

Steury fails to disclose covering the kiosk. However, it is old and well known that it is common business practice to provide some covering for portable kiosks for added security/privacy, such as the kiosks that are found in malls.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a covering for a kiosk, such as the one disclosed by Steury, to provide an added security measure.

19. **Claims 12 – 15 and 17 – 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Burghardi (US Patent 6,681,717 B2)**.

20. In regards to **claim 12, Burghardi** discloses a method for marketing a customized food product for a pet using a kiosk, said method comprising:

providing the kiosk including at least at least one of a consumer interaction station, an analysis station, and a workstation **(Column 3 Lines 32 – 34; Column 7 Lines 51 – 54)**;

providing a questionnaire at the consumer interaction station for profiling pets **(Column 2 Lines 27 – 30)**;

performing an analysis of a biological sample for a pet at the analysis station **(Column 2 Lines 46 – 59; Column 4 Lines 6 – 10)**;

receiving a customized pet food product formula based on the questionnaire answers and the biological sample at the analysis station **(Column 2 Lines 27 – 30)**; and

preparing a sample of the customized product for the consumer at the workstation **(Column 3 Lines 17 – 22)**.

Burghardi does not explicitly show a method of marketing, however, it would have been obvious to one skilled in the art that in order for producers, such as farmers, to know of the teachings of Burghardi some type of marketing or advertisement must be present in order to carry out the invention. Further still, prior teachings of customizing feed has also been known in the art as well, as is discussed in the background of the Burghardi.

21. In regards to **claim 13**, **Burghardi** discloses further comprising storing results of the questionnaire and the biological sample analysis as a pet profile at the analysis station **(Column 2 Lines 24 – 30)**.

22. In regards to **claim 14**, **Burghardi** discloses further comprising using the pet profile stored at the analysis station to prepare additional portions of the product additive at the workstation for repeat consumers **(Column 7 Lines 58 – 67 – Column 8 Lines 1 – 13)**.

23. In regards to **claim 15**, **Burghardi** discloses wherein preparing a sample of the customized product at the workstation further comprises preparing a custom product

additive to be added to a base formula **(Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)**.

24. In regards to **claim 17**, **Burghardi** discloses wherein preparing a sample of the customized product comprises adding at least one of a dry product additive and a liquid additive to the base formula **(wherein it is inherently included that the various ingredients making up the custom feed would contain a combination of dry, liquid, or combination of dry and liquid; all of which are well known in the art)**.

25. In regards to **claim 18**, **Burghardi** discloses wherein receiving a customized pet food product formula further comprises modeling questionnaire responses and the analysis of the biological sample **(Column 7 Lines 49 – 57)**.

26. In regards to **claim 19**, **Burghardi** discloses wherein performing an analysis of a biological sample for a pet comprises performing the analysis using a computer located at the analysis station **(Column 3 Lines 23 – 33)**.

27. In regards to **claim 20**, **Burghardi** discloses a method for providing a customized food product for a pet using a kiosk, the method comprising:

providing the kiosk including at least one of a customer interface area, a biological sample analysis and handling area, a base product storage area, at least one product additive storage area, and an ingredient mixing and customer observation area **(Column 3 Lines 32 – 34)**;

receiving at least one of a biological sample and pet questionnaire information at the customer interface area **(Column 2 Lines 27 – 30, 46 – 59; Column 4 Lines 6 – 10)**;

processing the data from the sample and the questionnaire at the biological sample analysis and handling area **(Column 2 Lines 46 – 59; Column 4 Lines 6 – 10)**;

selecting a kibble from the base product storage area based on the processed data **(Column 3 Lines 17 – 22)**;

mixing a customized additive from ingredients stored in the product additive storage area at the ingredient mixing and customer observation area based on the processed data **(Column 1 Lines 8 – 12; Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)** ; and

presenting the selected kibble and the customized additive to the customer at the ingredient mixing and customer observation area **(Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)**.

However, Burghardi does not explicitly disclose the use of a kiosk. Nevertheless, Burghardi discloses the use of a workstation(s), and the like, **(Column 3 Lines 32 – 34)** and one skilled in the art of computer workstations would have found it obvious that such the workstation disclosed by Burghardi is indeed a kiosk. Burghardi discloses the workstation(s) that can be used in various locations, such as at the ingredient supplier or farm **(Column 3 Lines 23 – 34)**, and that it serves as an interface for a user in order to input information for the production of a custom feed.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that Burghardi does indeed provide a kiosk that includes a

customer interface so that information can be inputted to produce a custom feed for a specific animal/need.

28. In regards to **claim 21**, **Burghardi** discloses wherein processing the data from the sample and the questionnaire further comprises generating feeding instructions and package labels **(Column 4 Lines 6 – 10)**.

29. In regards to **claim 22**, **Burghardi** discloses wherein presenting the selected kibble and the customized additive further comprises providing feeding instructions and package labels to the customer **(Column 4 Lines 6 – 10)**.

30. In regards to **claim 23**, **Burghardi** fails to disclose wherein presenting the selected kibble and the customized additive further comprises presenting the customer with a customized measuring scoop for the kibble and a custom-selected spoon for the customized additive.

However, it would have obvious to one skilled in the art that some type of measuring device must be provided in order to properly deliver the appropriate quantity of feed to the animal/pet. Further still, Burghardi discloses that providing to much of a specific ingredient to an animal would produce unhealthy and possibly dangerous results **(Column 4 Lines 51 – 67)**. Although Burghardi does present a solution to prevent too much of a specific ingredient to be incorporated in the overall quantity of the feed one skiledl in the art, such as a farmer or veterinarian, would also know that overfeeding/underfeeding an animal is also unhealthy and that appropriate quantities must be measured out prior to the feeding.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Burghardi to provide a customized measuring cup and custom-selected spoon in order to properly measure the quantity of feeding to prevent overfeeding/underfeeding.

31. In regards to **claim 24**, **Burghardi** discloses wherein presenting the selected kibble and the customized additive further comprises presenting the customer with recommendations concerning frequency and conditions of future biological sample analyses and profile updates for their pet **(Column 9 Lines 10 – 33; Column 10 Lines 25 – 40; Column 11 Lines 47 – 51)**.

32. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Burghardi (US Patent 6,681,717 B2)** in view of **Steury et al. (US Patent 6,416,270 B1)**.

33. In regards to **claim 16**, **Burghardi** fails to disclose further comprising affixing graphics panels to at least one of the consumer interaction station, the analysis station, and the workstation.

However, Steury discloses a kiosk configured to accept user input and dispense an item requested by the user. Steury teaches faceplates containing printed graphics, icons, and a display in order to instruct the user on how to use the kiosk **(Column 4 Lines 47 – 57)**.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Burghardi in view of the teachings of Steury to

provide graphics on a kiosk station in order to instruct a user on how to properly use the various functions that the kiosk may provide.

Response to Arguments

34. Applicant's arguments with respect to claims 1 - 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

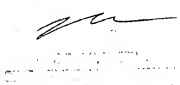
35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure can be found in PTO-892 Notice of References Cited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerardo Araque Jr. whose telephone number is (571)272-3747. The examiner can normally be reached on Monday - Friday 8:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Weiss can be reached on (571) 272-6812. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GA
1/18/07



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PTO/SB/08A (08-00)

Approved for use through 10/31/2002. OMB 0651-0031

U.S. Patent and Trademark Office: US DEPARTMENT OF COMMERCE

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Substitute for form 1449A/PTO				*Complete if Known*	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				Application Number	09/882,198
				Filing Date	06/15/2001
(use as many sheets as necessary)				First Named Inventor	Gregory J. Norsworthy
				Group Art Unit	3643
				Examiner Name	
Sheet	1	of	1	Attorney Docket Number	6204-00149

U.S. PATENT DOCUMENTS							
Examiner Initials*	Cite No.[1]	U.S. Patent Document Number	Kind Code[2] (if known)	Name of Patentee or Applicant Of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
GA	AA	6,254,910 B1		Paluch	July 3, 2001	

FOREIGN PATENT DOCUMENTS								
Examiner Initials*	Cite No.[1]	Foreign Patent Document Office[3]	Number[4]	Kind Code[2] (if known)	Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[5]
	FA							

OTHER PRIOR ART - - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the items (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

Examiner Signature	/Gerardo Araque Jr/	Date Considered:	01/18/2007

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Unique citation designation number. [2]Applicant is to place a checkmark here if English language Translation is attached.

Burden Hour Statement: This form is estimated to take 2.0 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

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PTO/SB/08A (04-03)
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Substitute for form 1449/PTO

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 2

Complete If Known	
Application Number	09/882,198
Filing Date	June 15, 2001
First Named Inventor	Norsworthy, et al.
Art Unit	3629
Examiner Name	
Attorney Docket Number	7311/US/NP

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
GA	AA	US- 5,894,029	04/13/1999	Brown, et al.	
GA	AB	US- 5,954,640	09/21/1999	Szabo	
GA	AC	US- 4,273,788	06/16/1981	Bone, et al.	
GA	AD	US- 4,006,266	02/01/1977	Bone, et al.	
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FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number [4] Kind Code[5] (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]

RECEIVED
JUN 11 2003
GROUP 3600

Examiner Signature	/Gerardo Araque Jr/	Date Considered	01/18/2007

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

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OIPE JUN 0 9 2003 PATENT & TRADEMARK OFFICE

PTO/SB/08B (04-03)
Approved for use through 04/30/2003. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 2

Complete if Known	
Application Number	09/882,198
Filing Date	June 15, 2001
First Named Inventor	Norsworthy, et al.
Art Unit	3629
Examiner Name	
Attorney Docket Number	7311/US/NP

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
GA	FA	PCT INTERNATIONAL SEARCH REPORT Dated 05/15/03 (4 pgs.); In re International Application No.: PCT/US02/18577: Filed 06/13/2002	
GA	FB	STEWART, LAURA; Bone Appetit caters to man's best friend; Daily Herald [Lake Edition]; 02/16/00; Paddock Publications; Arlington Heights, US	
GA	FC	DESILVA, CRAIG; Going to the dogs.; Hawaii Business; Jan 200, Vol 45 Issue 7, p 44, 1p, 1c; EBSCO Publishing; US	

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Examiner Signature	/Gerardo Araque Jr/	Date Considered	01/18/2007

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[1] Applicant's unique citation designation number (optional). [2] Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Notice of References Cited	Application/Control No. 09/882,198	Applicant(s)/Patent Under Reexamination NORSWORTHY ET AL.	
	Examiner Gerardo Araque Jr.	Art Unit 3629	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,146,270 B1	11-2000	Huard et al.	463/12
*	B	US-6,681,717 B2	01-2004	Burghardt et al.	119/51.02
*	C	US-6,531,104 B1	03-2003	Borio et al.	423/243.01
*	D	US-4,712,511	12-1987	Zamzow et al.	119/51.02
*	E	US-5,105,767	04-1992	Gordon et al.	119/57.92
*	F	US-5,424,957	06-1995	Kerkhoff et al.	700/240
*	G	US-5,954,640	09-1999	Szabo, Andrew J.	600/300
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EXHIBIT B

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/882,198	06/15/2001	Gregory J. Norsworthy	115808-460	8393

29157 7590 06/28/2007

BELL, BOYD & LLOYD LLP
P.O. Box 1135
CHICAGO, IL 60690

EXAMINER	
ARAQUE JR, GERARDO	
ART UNIT	PAPER NUMBER
3629	

NOTIFICATION DATE	DELIVERY MODE
06/28/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATENTS@BELLBOYD.COM

Office Action Summary	Application No.	Applicant(s)	
	09/882,198	NORSWORTHY ET AL.	
	Examiner	Art Unit	
	Gerardo Araque Jr.	3629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1 – 4 and 6 – 11** are rejected under 35 U.S.C. 102(e) as being anticipated by **Steury et al. (US Patent 6,416,270 B1)**.

3. In regards to **claim 1**, **Steury** discloses a kiosk configured for selling and manufacturing customized food for a pet, said kiosk comprising:

a customer interface area for receiving information regarding the pet **(Column 4 Lines 38 – 39)**;

a biological sample analysis and handling area for analyzing the biological information regarding the pet **(Column 4 Lines 17 – 19; moreover, each storage unit, tray, as well as the top of the kiosk is capable of providing an area for an individual to work on)**;

a computer for receiving information regarding the pet and generating a pet profile **(Column 3 Lines 60 – 62; Column 4 Lines 38 – 39)**;

a base product display area **(Column 4 Lines 16 – 18)**;

at least one product additive storage area having at least one shelf **(Column 2 Lines 14 – 18)**; and

an ingredient mixing and customer observation area **(Column 4 Lines 17 – 19; moreover, each storage unit, tray, as well as the top of the kiosk is capable of providing an area for an individual to work on)**.

4. In regards to **claim 2**, **Steury** discloses wherein said biological sample analysis and handling area is configured with a biological sample disposal area **(Column 2 Lines 1 – 2, 62 – 65; wherein the kiosk is capable or receiving items from a customer and held, which would then be disposed of, if necessary, by a personnel)**.

5. In regards to **claim 3**, **Steury** discloses wherein said kiosk is further configured to be expanded or contracted **(Column 3 Lines 56 – 57)**.

6. In regards to **claim 4**, **Steury** discloses wherein said kiosk is further configured to be portable **(Claim 1 Part A)**.

7. In regards to **claim 6**, **Steury** discloses further comprising a base product storage area **(Column 2 Lines 14 – 18)**.

8. In regards to **claim 7**, **Steury** discloses wherein said kiosk is constructed from at least one of wire shelving, stainless steel supports, plastic bins, and laminated wood and stainless steel shelving **(Column 3 Lines 1 – 7)**.

9. In regards to **claim 8**, **Steury** discloses wherein said at least one product additive storage area is stocked with at least one of a dry inventory and a liquid inventory **(Column 5 Lines 19 – 21)**.

10. In regards to **claim 9**, **Steury** discloses wherein said kiosk comprises three separate units, including at least one of a consumer interaction station **(Column 2 Lines 4 Lines 38 – 39)**, an analysis station **(Column 2 Lines 6 – 9)**, and a workstation **(Column 2 Lines 31 – 34)**.

11. In regards to **claim 10**, **Steury** discloses further comprising a computer configured to store at least one custom pet food for an individual pet profile **(Column 3 Lines 60 – 62; Column 5 Lines 58 – 64)**.

12. In regards to **claim 11**, **Steury** discloses further comprising graphics panels to advertise said kiosk and the functionality of said kiosk **(Column 4 Lines 47 – 57)**.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Steury et al. (US Patent 6,416,270 B1)**.

15. In regards to **claim 5**, **Steury** discloses wherein said kiosk is further configured to be locked **(Column 4 Lines 21 – 22)**.

Steury fails to disclose covering the kiosk. However, it is old and well known that it is common business practice to provide some covering for portable kiosks for added security/privacy, such as the kiosks that are found in malls.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a covering for a kiosk, such as the one disclosed by Steury, to provide an added security measure.

16. **Claims 12 – 15 and 17 – 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Burghardi (US Patent 6,681,717 B2)**.

17. In regards to **claim 12**, **Burghardi** discloses a method comprising:

providing the kiosk including at least at least one of a consumer interaction station, an analysis station, and a workstation **(Column 3 Lines 32 – 34; Column 7 Lines 51 – 54)**;

providing a questionnaire at the consumer interaction station for profiling pets **(Column 2 Lines 27 – 30)**;

performing an analysis of a biological sample for a pet at the analysis station **(Column 2 Lines 46 – 59; Column 4 Lines 6 – 10)**;

receiving a customized pet food product formula based on the questionnaire answers and the biological sample at the analysis station **(Column 2 Lines 27 – 30)**; and

preparing a sample of the customized product for the consumer at the workstation **(Column 3 Lines 17 – 22)**.

Burghardi does not explicitly show a method of marketing, however, it would have been obvious to one skilled in the art that in order for producers, such as farmers, to know of the teachings of Burghardi that some type of marketing or advertisement must be present in order to carry out the invention. Further still, prior teachings of

customizing feed has also been known in the art as well, as is discussed in the background of the Burghardi.

18. In regards to **claim 13**, **Burghardi** discloses further comprising storing results of the questionnaire and the biological sample analysis as a pet profile at the analysis station **(Column 2 Lines 24 – 30)**.

19. In regards to **claim 14**, **Burghardi** discloses further comprising using the pet profile stored at the analysis station to prepare additional portions of the product additive at the workstation for repeat consumers **(Column 7 Lines 58 – 67 – Column 8 Lines 1 – 13)**.

20. In regards to **claim 15**, **Burghardi** discloses wherein preparing a sample of the customized product at the workstation further comprises preparing a custom product additive to be added to a base formula **(Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)**.

21. In regards to **claim 17**, **Burghardi** discloses wherein preparing a sample of the customized product comprises adding at least one of a dry product additive and a liquid additive to the base formula **(wherein it is inherently included that the various ingredients making up the custom feed would contain a combination of dry, liquid, or combination of dry and liquid; all of which are well known in the art)**.

22. In regards to **claim 18**, **Burghardi** discloses wherein receiving a customized pet food product formula further comprises modeling questionnaire responses and the analysis of the biological sample **(Column 7 Lines 49 – 57)**.

23. In regards to **claim 19**, **Burghardi** discloses wherein performing an analysis of a biological sample for a pet comprises performing the analysis using a computer located at the analysis station **(Column 3 Lines 23 – 33)**.

24. In regards to **claim 20**, **Burghardi** discloses a method for providing a customized food product for a pet using a kiosk, the method comprising:

providing the kiosk including at least one of a customer interface area, a biological sample analysis and handling area, a base product storage area, at least one product additive storage area, and an ingredient mixing and customer observation area **(Column 3 Lines 32 – 34)**;

receiving at least one of a biological sample and pet questionnaire information at the customer interface area **(Column 2 Lines 27 – 30, 46 – 59; Column 4 Lines 6 – 10)**;

processing the data from the sample and the questionnaire at the biological sample analysis and handling area **(Column 2 Lines 46 – 59; Column 4 Lines 6 – 10)**;

selecting a kibble from the base product storage area based on the processed data **(Column 3 Lines 17 – 22)**;

mixing a customized additive from ingredients stored in the product additive storage area at the ingredient mixing and customer observation area based on the processed data **(Column 1 Lines 8 – 12; Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)** ; and

presenting the selected kibble and the customized additive to the customer at the ingredient mixing and customer observation area **(Column 4 Lines 51 – 67 – Column 5 Lines 1 – 8)**.

However, Burghardi does not explicitly disclose the use of a kiosk. Nevertheless, Burghardi discloses the use of a workstation(s), and the like, **(Column 3 Lines 32 – 34)** and one skilled in the art of computer workstations would have found it obvious that such the workstation disclosed by Burghardi is indeed a kiosk. Burghardi discloses the workstation(s) that can be used in various locations, such as at the ingredient supplier or farm **(Column 3 Lines 23 – 34)**, and that it serves as an interface for a user in order to input information for the production of a custom feed.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention that Burghardi does indeed provide a kiosk that includes a customer interface so that information can be inputted to produce a custom feed for a specific animal/need.

25. In regards to **claim 21**, **Burghardi** discloses wherein processing the data from the sample and the questionnaire further comprises generating feeding instructions and package labels **(Column 4 Lines 6 – 10)**.

26. In regards to **claim 22**, **Burghardi** discloses wherein presenting the selected kibble and the customized additive further comprises providing feeding instructions and package labels to the customer **(Column 4 Lines 6 – 10)**.

27. In regards to **claim 23**, **Burghardi** fails to disclose wherein presenting the selected kibble and the customized additive further comprises presenting the customer

with a customized measuring scoop for the kibble and a custom-selected spoon for the customized additive.

However, it would have obvious to one skilled in the art that some type of measuring device must be provided in order to properly deliver the appropriate quantity of feed to the animal/pet. Further still, Burghardi discloses that providing to much of a specific ingredient to an animal would produce unhealthy and possibly dangerous results **(Column 4 Lines 51 – 67)**. Although Burghardi does present a solution to prevent too much of a specific ingredient to be incorporated in the overall quantity of the feed one skiledl in the art, such as a farmer or veterinarian, would also know that overfeeding/underfeeding an animal is also unhealthy and that appropriate quantities must be measured out prior to the feeding.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Burghardi to provide a customized measuring cup and custom-selected spoon in order to properly measure the quantity of feeding to prevent overfeeding/underfeeding.

28. In regards to **claim 24**, **Burghardi** discloses wherein presenting the selected kibble and the customized additive further comprises presenting the customer with recommendations concerning frequency and conditions of future biological sample analyses and profile updates for their pet **(Column 9 Lines 10 – 33; Column 10 Lines 25 – 40; Column 11 Lines 47 – 51)**.

29. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Burghardi (US Patent 6,681,717 B2)** in view of **Steury et al. (US Patent 6,416,270 B1)**.

30. In regards to **claim 16**, **Burghardi** fails to disclose further comprising affixing graphics panels to at least one of the consumer interaction station, the analysis station, and the workstation.

However, Steury discloses a kiosk configured to accept user input and dispense an item requested by the user. Steury teaches faceplates containing printed graphics, icons, and a display in order to instruct the user on how to use the kiosk **(Column 4 Lines 47 – 57)**.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Burghardi in view of the teachings of Steury to provide graphics on a kiosk station in order to instruct a user on how to properly use the various functions that the kiosk may provide.

Response to Arguments

31. Applicant's arguments filed 4/11/07 have been fully considered but they are not persuasive.

Rejection under 35 USC §112, second paragraph

32. Rejections made under 35 USC §112, second paragraph, has bee withdrawn.

Rejection under 35 USC §102

33. In response to applicant's argument that "Steury fails to suggest a kiosk configured for selling and manufacturing customized food for a pet as is required, in

part, by Claim 1; and that Steury provides no teaching or suggestion to one of ordinary skill in the art that the drawers can be or are used to store pet food products that are mixed with other ingredients before the pet food product is dispensed to a customer", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

Rejection under 35 USC §103

Applicant argues that the "patentability of Claim 1 as previously discussed renders moot the obviousness rejection of Claim 5 that depends form Claim 1." However, the Examiner has already responded to the arguments made towards claim 1 and asserts the rejection is proper. As a result, the rejection under claim 5 is proper and, further still, the applicant has failed to explicitly point out any of the supposed errors of the rejection, as is required (37 CFR 1.111). The applicant also uses the same argument for claim 16. As a result, the Examiner's response to claim 16 will be the same as the one made for claim 5.

34. Applicant argues the Burghardi fails to teach or suggest a method for marketing a food product for a pet using a kiosk. However, the Examiner asserts that proper reasoning and motivation has already been provided regarding this matter (see Page 6 of the Office Action).

The applicant further argues that Burghardi fails to disclose or suggest providing the kiosk including at least one of a consumer interaction station, an analysis station,

and a workstation. The applicant submits that providing a computer in a workstation is not the same as, for example, providing a kiosk including at least one of a consumer interaction station, an analysis station and a workstation. However, the Examiner asserts that it is obvious that the workstation disclosed by Burghardi is indeed a workstation (Col. 3 Lines 23 – 34). As a result, wherever that analysis is performed the computer must be present and would obviously be placed on some type of surface to carryout the analysis where consumer interaction (for example with a farmer) would be carried out.

The applicant also argues that Burghardi fails to disclose or suggest analyzing a biological sample. However, the Examiner asserts that Burghardi discloses that a pet profile is created and that one skilled in the art would have found it obvious to analyzed a pet's biological sample in order to accurately analyzing a pet's diet in order to better create a customized pet feed.

Conclusion

35. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerardo Araque Jr. whose telephone number is (571)272-3747. The examiner can normally be reached on Monday - Friday 8:30AM - 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Weiss can be reached on (571) 272-6812. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

GA
6/15/07

JOHN G. WEISS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600

EXHIBIT C

US006416270B1

(12) **United States Patent**
Steury et al.

(10) **Patent No.: US 6,416,270 B1**
(45) **Date of Patent: Jul. 9, 2002**

(54) **AUTOMATED LIBRARY KIOSK**

(75) Inventors: **Rudy Steury**, Richfield; **Donald E. Thompson**, Chaska, both of MN (US)

(73) Assignee: **Compu Shop Services, LLC**, St. Paul, MN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/650,439**

(22) Filed: **Aug. 29, 2000**

(51) **Int. Cl.**[7] **B65G 65/00**

(52) **U.S. Cl.** **414/282**; 414/268; 414/273; 414/280; 414/281; 700/232; 700/237; 700/242

(58) **Field of Search** 414/268, 280, 414/281, 282, 273; 700/231, 237, 232, 242

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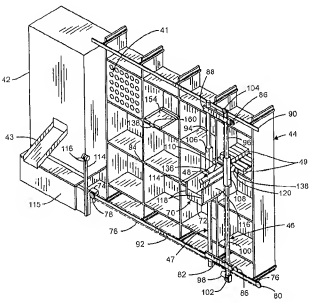
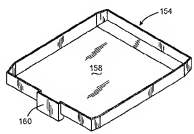
Primary Examiner—Christopher P. Ellis
Assistant Examiner—Khoi H. Tran
(74) *Attorney, Agent, or Firm*—D L. Tschida

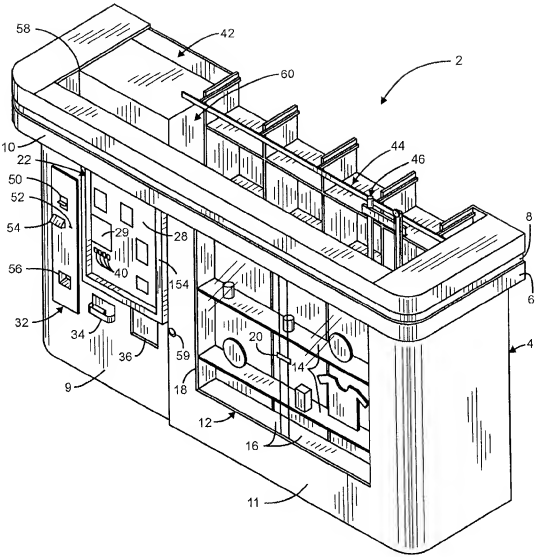
(57) **ABSTRACT**

A self-service kiosk having a walk-in enclosure, interactive selection panel, multi-section inventory storage area for dispensing items and accepting returns. User selections are entered via instructions entered at an interactive panel containing a selection menu of graphical icons and messages. A programmable controller monitors entered identification data and payments to control the dispensing and return of selected items from assigned storage locations via X-Y-Z track driven, transfer and end effect assemblies. Associated software manages payment transactions via a bill receiver, coin changer, credit card verifier, and receipt printer and develops associated administrative inventory status reports. One end effect includes a hook that interconnects to storage trays. The end effect extends and retracts the trays onto a support platform and conveys the trays and items back and forth from the storage space. A reciprocating comb assembly is also included that cooperates with a magnetic end effect and transfer container.

14 Claims, 11 Drawing Sheets



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42
2
60
10
22
50
52
54
56
32
34
36
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18
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16
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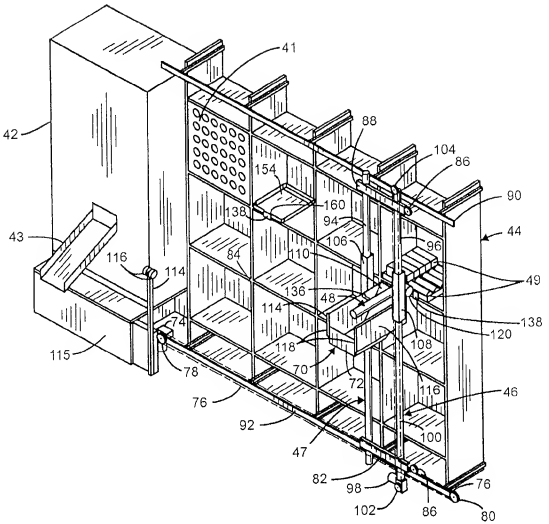
20
14
44
46
8
6
4
29
28
40
154

FIG. 1


41
42
88
104
86
154
90
160
138
94
44
43
106
96
116
84
110
114
49
136
48
114
138
74
120
118
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116
46
76
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82
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102
86
80

FIG. 2

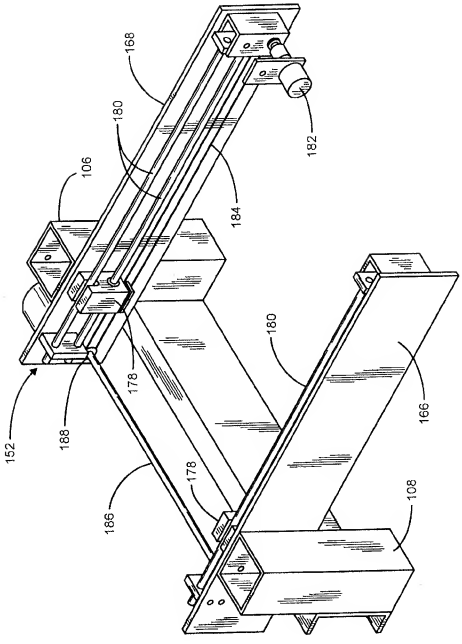

FIG. 3

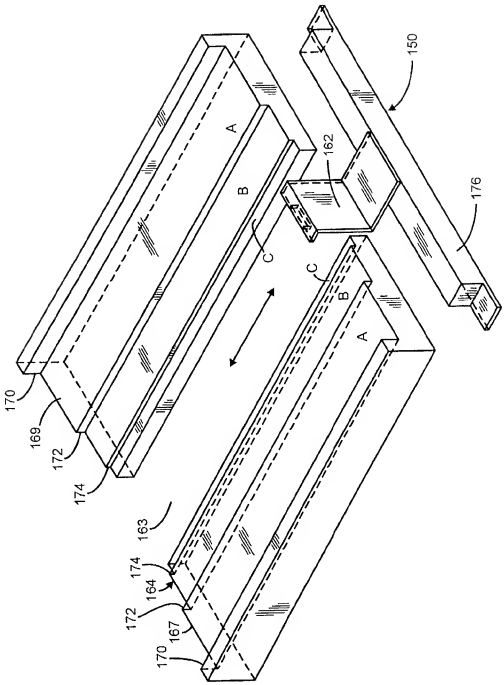

FIG. 4

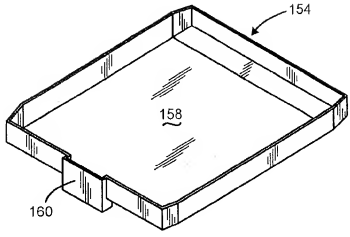

FIG. 5

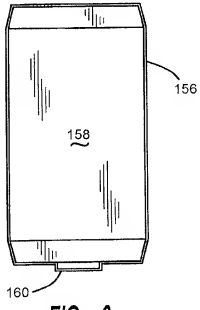

FIG. 6

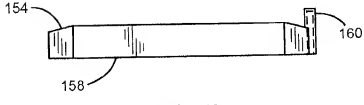

FIG. 7

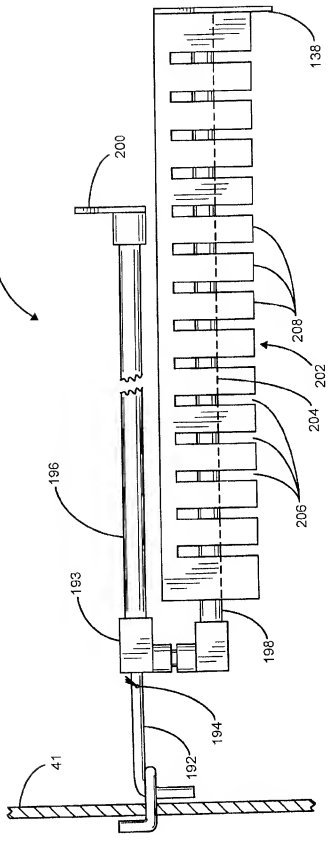

FIG. 8

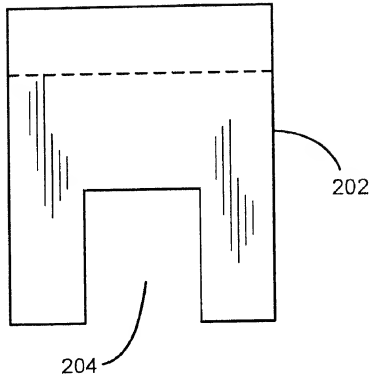

FIG. 9

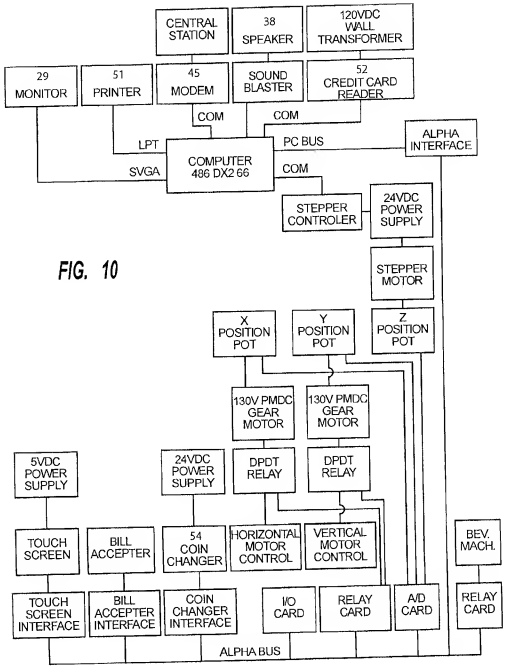
CENTRAL STATION
38 SPEAKER
120VDC WALL TRANSFORMER
29 MONITOR
51 PRINTER
45 MODEM
SOUND BLASTER
52 CREDIT CARD READER
COM
COM
LPT
PC BUS
ALPHA INTERFACE
SVGA
COMPUTER 486 DX2 66
COM
STEPPER CONTROLER
24VDC POWER SUPPLY
STEPPER MOTOR
X POSITION POT
Y POSITION POT
Z POSITION POT
130V PMDC GEAR MOTOR
130V PMDC GEAR MOTOR
5VDC POWER SUPPLY
24VDC POWER SUPPLY
DPDT RELAY
DPDT RELAY
TOUCH SCREEN
BILL ACCEPTER
54 COIN CHANGER
HORIZONTAL MOTOR CONTROL
VERTICAL MOTOR CONTROL
BEV. MACH.
TOUCH SCREEN INTERFACE
BILL ACCEPTER INTERFACE
COIN CHANGER INTERFACE
I/O CARD
RELAY CARD
A/D CARD
RELAY CARD
ALPHA BUS

FIG. 10

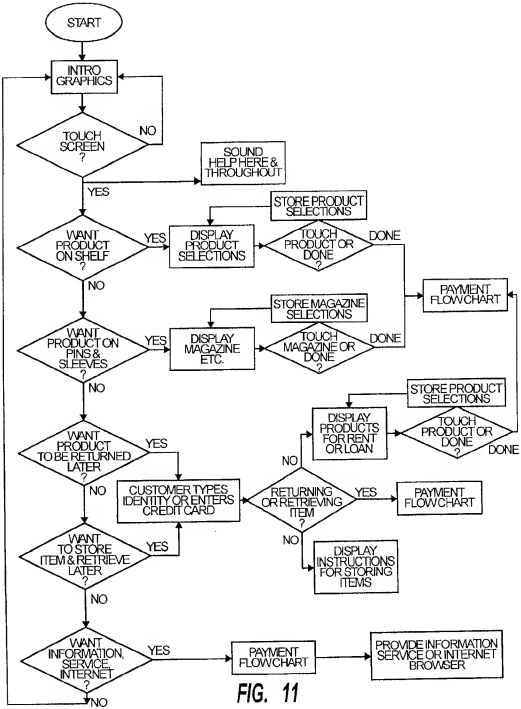
START
INTRO GRAPHICS
TOUCH SCREEN ?
NO
YES
SOUND HELP HERE & THROUGHOUT
WANT PRODUCT ON SHELF ?
YES
DISPLAY PRODUCT SELECTIONS
STORE PRODUCT SELECTIONS
TOUCH PRODUCT OR DONE ?
DONE
NO
PAYMENT FLOWCHART
WANT PRODUCT ON PINS & SLEEVES ?
YES
DISPLAY MAGAZINE ETC.
STORE MAGAZINE SELECTIONS
TOUCH MAGAZINE OR DONE ?
DONE
NO
STORE PRODUCT SELECTIONS
WANT PRODUCT TO BE RETURNED LATER ?
YES
DISPLAY PRODUCTS FOR RENT OR LOAN
TOUCH PRODUCT OR DONE ?
DONE
NO
CUSTOMER TYPES IDENTITY OR ENTERS CREDIT CARD
RETURNING OR RETRIEVING ITEM ?
YES
PAYMENT FLOWCHART
NO
WANT TO STORE ITEM & RETRIEVE LATER ?
YES
DISPLAY INSTRUCTIONS FOR STORING ITEMS
NO
WANT INFORMATION, SERVICE, INTERNET ?
YES
PAYMENT FLOWCHART
PROVIDE INFORMATION SERVICE OR INTERNET BROWSER
NO

FIG. 11

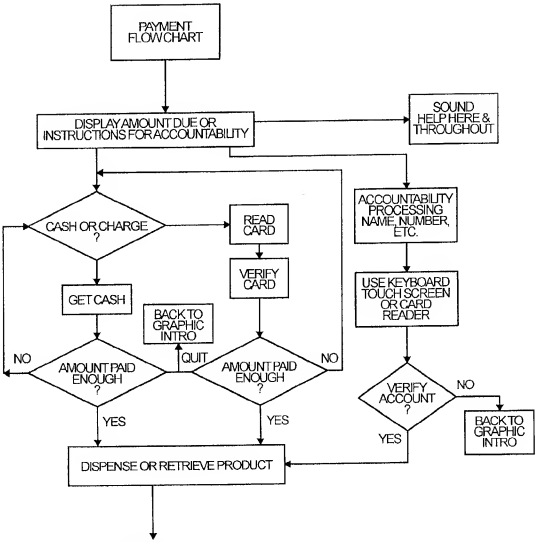

FIG. 12B

FIG. 12A

FIG. 12A

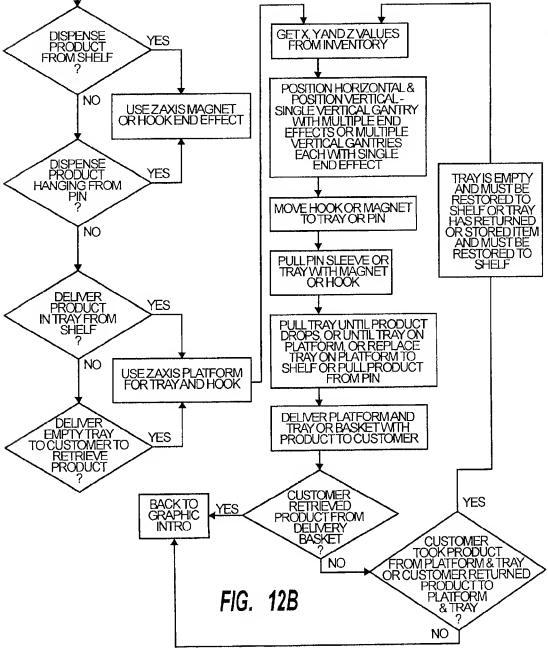

FIG. 12B

AUTOMATED LIBRARY KIOSK

BACKGROUND OF THE INVENTION

The present invention relates to automated dispensing equipment and, in particular, to a library kiosk for sundry items that are dispensed and returned to users having personal identification codes.

Varieties of merchandise dispensing assemblies have been developed for many different types of products. Most typically such assemblies operate with uniformly packaged products. Depending upon the packaging, an attendant electro-mechanical support assembly contains the individual packages and sequentially advances the product as requested by a user. Refrigerated and heated products are maintained in enclosures having mechanical support units that dispense the product at a preferred temperature for the product.

Frequently encountered examples of this type of dispensing equipment are dispensers for snack foods such as canned and bottled beverages, candy, chips, popcorn, ice cream bars, etc.. The products are arranged in one or more partitioned racks, trays or spiral clamps in seriatim fashion. The product is dispensed by incrementally advancing the support assembly in response to user-entered selections and deposited moneys.

U.S. Pat. Nos. 4,412,292; 4,766,548; 5,159,560; and 5,207,784 disclose remotely monitored vending dispensers for beverages and videocassettes. Associated control is included for monitoring, recording, and/or communicating inventory status to a control center. Inventory administration can be performed on-site or communicated to the central center. Support personnel either on a periodic basis or in response to reported status data access and maintain the inventory.

Information, postage and newspaper kiosks are also known at U.S. Pat. Nos. 5,369,258; 5,271,669; 4,817,043; 4,571,898; and 4,265,059. The former kiosks include interactive capabilities and dispense information from a contained monitor and stamps from a dispenser. The latter newspaper kiosks principally provide enclosures for papers and various novelty items.

A variety of automated teller machines are also known having an interactive control capabilities, and dispensers for distributing money. Interactive greeting card dispensers are also known which custom print cards in response to user entries.

A kiosk capable of dispensing non-uniformly packaged products is also disclosed at U.S. Pat. No. 5,499,707. The stored items are contained in bottomless compartments that are manipulated with a three-axis drive assembly. The kiosk, however, is not operative to accept and store returned items.

The present invention was developed to provide an interactive, self-service, library kiosk that dispenses sundry items and accepts returns. The storage sections and X-Y-Z drive mechanisms of the kiosk are adapted to operate with a variety of end effects (e.g. bottomed and bottomless trays and a slide comb) to dispense and accept returns of stored items. Returned items are restored to their original or other designated storage locations. User selections are made through an interactive audio-visual display panel via personal identification codes. Administrative functions are performed by a local programmable controller and are reported to a remote monitoring station.

SUMMARY OF THE INVENTION

It is a primary object of the invention to provide an automated, self-service kiosk capable of dispensing and accepting returns of a large variety of items of differing size and packaging configurations.

It is a further object of the invention to provide a dispenser having a walk-in enclosure that permits access to stored contents and permits periodic maintenance and servicing.

It is a further object of the invention to provide an interactive, multi-media dispenser that responds and confirms user entered selections and personal identification numbers (pin's).

It is a further object of the invention to provide a dispenser capable of cash or credit card transactions and able to provide receipted transactions.

It is a further object of the invention to provide a dispenser having multiple storage locations and shelving that supports bottomed and bottomless slide drawers that contain inventory and end effects that manipulate the items to and from user access dispensing and/or return ports.

It is a further object of the invention to provide a dispenser having a pegboard storage location that supports comb-type end effects and inventory mounted in recesses between comb teeth along a slide rail.

It is a further object of the invention to provide a controller that cooperates with drive and end effect assemblies that are responsive to computed X, Y and Z axis drive signals developed from coordinates assigned to system storage locations to dispense and/or return items to the storage locations.

The foregoing objects, advantages and distinctions of the invention, among others, are apparent from a preferred construction that provides a walk-in kiosk. Inventory is contained at a beverage dispenser and a modular arrangement of of shelves that are accessible from an interior access space. Each shelf contains a number of drawers or trays that slide on the shelves. The trays can include a bottom or be bottomless. A variety of items of differing sizes and configuration are contained in the drawers.

Some items are mounted to comb-type storage assemblies mounted to pegboard. Items such as bagged or carded materials having punched holes are mounted in recesses between the comb teeth along a slide rail, inserted through the holes. Extension of the comb via a magnetic end effect releases the items from the rail.

The physical dimensions and parameters of each drawer and the X, Y and Z coordinates of each drawer and slide comb storage location is programmed into a digital controller. Metal pull-tabs or plates attached some of the drawers and combs cooperate with a magnetic end effect. Other drawers cooperate with a hooked end effect and transfer platform. A closed loop motorized drive assembly axially directs the end effects in response to X, Y, and Z drive signals. Differing end effects can be attached to the X and Y track/chain drive and/or the vertical columns supported thereto.

User pin's, storage and inventory data is programmed into the digital controller that monitors user receipts, returns and payments. Payments are recorded at an associated bill receiver, change and receipt dispenser and/or pin/credit card verifier. Appropriate Z-axis drive signals are determined in relation to current inventory status. A modem connection validates credit transactions and permits reporting periodic administrative reports to a central station and from which maintenance personnel are dispatched to maintain inventory supplies.

Still other objects advantages and distinctions of the invention will become more apparent upon reference to the

following description with respect to the appended drawings. To the extent various modifications and improvements have been considered they are described as appropriate. The description should not be literally construed in limitation of the scope of the invention. Rather, the invention should be construed from the spirit and scope of the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a perspective view of the merchandising kiosk with the top panel removed.

FIG. **2** shows a perspective view of a track mounted end effect drive assembly.

FIG. **3** shows a perspective view of a vertical and horizontal end effect drive assembly.

FIG. **4** shows an exploded assembly view in perspective to a multi-level tray support platform and tray hook for a closed or open bottom tray end effect assembly.

FIG. **5** shows a perspective drawing to a tray that slides on the "A" level of the platform of FIG. **4**.

FIG. **7** shows a side view to the trays of FIGS. **5** and **6**.

FIG. **6** shows a perspective drawing to a tray that slides on the "C" level of the platform of FIG. **4**.

FIG. **8** shows a pegboard mounted comb type end effect assembly.

FIG. **9** is an end view to the comb of FIG. **8**.

FIG. **10** is a schematic diagram to the system controller.

FIG. **11** is a system flow chart to the processor controller software that responds to user entered data and controls the system operation and the X-Y-Z drive signals to the track and end effect drive assemblies.

FIG. **12** shows a generalized flow chart to the payment and dispense and retrieve functions.

Identical reference callouts at the drawings identify related structure and should be so construed.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With attention to FIG. **1**, a perspective view is shown of a kiosk **2** of the invention. The general construction of the kiosk **2** is similar to that described at U.S. Pat. No. 5,499, 707. The kiosk **2** provides a vending center for any variety of items that can be sold or loaned, for example, retail merchandise, tools, and library and instruction materials. With the exception of periodic maintenance and re-supply of inventory, the kiosk **2** is fully automated and does not require any on-site staff.

The kiosk **2** can be readily fitted to available wall space or central floor space at any user site without undue cost. With the exception of necessary power and telephone connections, the kiosk **2** requires no special electrical or plumbing connections. The kiosk **2** occupies a floor space of approximately 4 feetx10 to 15 feet, depending upon the volume of inventory. As more or less inventory is required, the physical size of the enclosure **4** can be adjusted. As configured at FIG. **1**, an open back of the enclosure **4** is mounted against an available wall.

The kiosk **2** is normally positioned at locations known to the users and who are assigned personal identification numbers (pin's). In a typical setting, the kiosk **2** might be located in a corridor or lobby of a building or a work area of a business. A relatively high visibility location is preferred, which is in the normal travel path of the targeted user, and which is convenient to support staff to assure optimal customer satisfaction and provide a degree of security.

The enclosure **4** is constructed as a wood framed structure and provides a laminated wood and metal trim exterior. The enclosure **4** includes a canopy **6** that projects beyond the enclosure walls **4**. The canopy **6** includes a metal trim strip **8** and supports associated accent lighting (not shown) in a space between an outer flange **10** and the front walls of the enclosure **4**.

The enclosure **4** can be constructed to any number of shapes. It can also be constructed using a variety of conventional metal and wood framing techniques to provide any desired degree of relative security for the contained merchandise. A variety of accent arrangements can be provided, depending upon the esthetics of the mounting location and/or user preference.

The enclosure **4** includes a hinged panel **9** and a stationary panel **11**. Prominently positioned at the front stationary panel **11** is a display case **12**. The display case **12** is recessed approximately 6 to 12 inches and includes a number of conventional glass shelves **14**. Safety glass doors **16** cooperate with an extruded metal trim **18** that contains channels that support slide tracks for the doors **16**. A lock **20** secures the doors **16**.

The display case **12** can be sized as desired and may alternatively project from either the stationary or hinged panels **11** and **9**. Presently, the case **12** occupies a space approximately 6 feet wide by 5 feet tall by 6 to 12 inches deep. The size can be varied as desired in relation to the dimensions to the enclosure **2**.

The items displayed in the case **12** are typically representative of some of the items contained in the kiosk **2**. Detailed listings of the inventory are available at an adjacent interactive panel **22**, discussed in more detail below, where a user enters his/her selections. The enclosure **4** at the above dimensions is capable of supporting 300 to 500 different items. Larger or smaller enclosures can be constructed depending upon the merchandise and/or installation location and/or re-supply schedule.

Mounted to one side of the display case **12** is the interactive user data entry panel **22**. The panel **22** senses user actions to dispense or to return specific items from and to inventory. A payment panel **32** and two dispensing ports **34** and **36** border the panel **22**. Depending upon the internal inventory transfer assemblies and control software, the ports **34** and/or **36** can be used to accept returned items. Any desired combination of dispensing and return ports can be included.

The panel **22** includes a faceplate **28** containing printed graphics, icons **40** and a display screen **29**. A computer controller **30** is mounted behind the faceplate **28**. The faceplate **28** is printed over with appropriate operating instructions and graphical icons **40** that depict general groupings or categories of the stored contents. The items contained in each group are further defined at the monitor **29**. An audio speaker **38**, see FIG. **10**, can be mounted in close proximity to the panel **22** to broadcast audio instructions to assist the customer and messages to attract customers.

The icons **40** and monitor **29** provide detailed instructions and lists of the stored items. The user follows the menu'ed instructions and selection sequence displayed at the monitor **29** to make appropriate selections. FIGS. **11** and **12** depict flow charts to the interactive selection and payment processes performed by the kiosk **2** with a user. FIG. **12** correlates the selections to alternative end effects that perform the dispensing and retrieval or return functions.

The monitor **29** may alternatively provide specifically programmed, menu'ed instructions and/or listings to the

customer for the particular merchandise programmed into the computer, without using icons **40** to pre-select category groups. The icons **40** might then be programmed to select the displayed item. Dedicated, specific purpose switches may also be mounted to the panel **22** and coupled to the computer controller **30** to appropriately operate the internally mounted dispensing equipment. The switches can be used in lieu of the touch screen capabilities at the panel **22** and monitor **29**. A monitor **29** having an active touch screen may also be used alone or in association with the touch panel.

With the entry and confirmation of a user pin and/or payment for desired items, supporting digital to analog interfaces and electro-mechanical drivers and servos, shown at FIG. **10** and more fully discussed at U.S. Pat. No. 5,499,707 and FIGS. **3–9**, appropriately respond to user entered selections. The selected item is appropriately dispensed to ports **34** and **36** or accepted from the available ports for return to inventory.

The kiosk **2** typically operates to dispense dry goods, although can be adapted to dispense beverages, such as shown in FIG. **2**. In such a configuration, a conventional beverage dispenser **42** is mounted inside the enclosure **4** and is aligned to the port **34** via a chute **43** to dispense a selected beverage. The beverage dispenser **42** can be deleted from the kiosk **2** when not practical to the user application.

Other items stored in the kiosk **2** are dispensed at the port **36**. Returns are also made to the port **36**. Stored inventory is contained within the enclosure **4** at modular inventory storage areas that in the kiosk **2** is principally a shelving assembly **44**. A space defined by pegboard **41** is also provided that cooperates with the comb-type retainers discussed below with respect to FIGS. **8** and **9**.

The storage space can be organized in any desired configuration relative to the dispensing/return ports. For example, additional rows of shelving **44** or walls of pegboard **41** can be mounted behind the shelving **44** or extend from the left end of the dispenser **42**. Regardless of the selected geometry, the associated transfer assembly **46** must be able to operate to deliver and retrieve selected items to and from the ports.

A driven, 3-axis transfer assembly **46** is mounted to the shelving **44**. The controller **30** operates in response to authorized user selections to manipulate one or more tower assemblies **47** that are attached to the transfer assembly **46** and the end effects supported to each tower **47**. Each end effect assembly is adapted to dispense and/or retrieve items from an assigned storage space that is adapted to each stored item.

A magnetic end effect **48** and transfer bin **70** are particularly shown at FIG. **2**. The end effect **48** provides a magnetic coupling with bottomless trays or drawers **49** supported at the shelving assembly **44**. The transfer bin **70** receives and dispenses the items to the outlet port **36**. FIGS. **3–9** provide alternative or additional end effect assemblies that can be mounted to any available towers **47** to convey items between the storage locations and the outlet port **36**.

The controller **30** maintains a running record of user interactions with the kiosk **2** and available inventory contained in the kiosk **2** to appropriately direct the tower **47** and supported end effect assemblies. Sales reports, payment verification, maintenance and re-supply information are transmitted from the controller **30** over a modem **45** and available phone lines to a central station, see FIG. **10**.

Coordinated with the controller **30** is the payment panel **32**. The panel **32** includes a bill reader **50**, credit card verifier **52** that is coupled to the modem **45**, receipt printer **51**, coin changer **54**, and a coin and receipt-dispensing tray **56**, see also FIG. **10**. The receipt printer **51**, reference FIG. **10**, is mounted to dispense a printed receipt of each user transaction at the tray **56** in addition to any coins directed from the bill reader **50** and coin changer **54**. Where the kiosk performs internal library functions, the receipt would typically show information regarding the loan, pending due dates and/or data confirming the aborting of the transaction due to delinquent transactions.

The panel **9**, which contains the primary user interface panels **22** and **32**, is hinged to the enclosure **4**. Upon disengaging a lock, the panel **9** can be rotated open to expose the beverage dispenser **42**, monitor **29**, computer controller **30**, bill reader **50**, credit card verifier **52**, receipt printer **51**, and coin changer **54**.

Also exposed with the pivoting of the panel **9** is an access space or walkway **60** between the shelving **44** and back of the display case **12**. The access space **60** extends the length of the shelving **44** and permits service and maintenance personnel access to the transfer assembly **46**, end effect **48**, transfer bin **70**, shelving **44** and pegboard **41** to maintain the inventory and proper operation of the kiosk **2**. All of the various electro-mechanical support assemblies, along with the storage locations can thus be accessed, maintained and serviced.

With attention to FIG. **2** particular details are shown to the construction of the shelving **44** and the mounting of the transfer assembly **46**, magnetic end effect assembly **48** and transfer bin **70** thereto. The transfer assembly **46** generally provides a track supported conveyer mechanism for the tower assembly **47**, end effect **48** and collection bin **70**.

As earlier noted, multiple transfer assemblies **46** can be layered one in front of the other or can extend from opposite sides of the outlet port **36**. One or more tower assemblies **47** can be attached to each assembly **46** and/or can support multiple end effects that can be the same or different.

Appropriate horizontal and vertical (i.e. "X" and "Y") Cartesian drive signals are provided from the controller **30** to a horizontal drive motor **74**. A chain or belt **76** is trained about a drive sprocket **78** and idler sprocket **80** and to a base frame **82** at the selector **46**. Movement of the tower **47** is indexed to a pre-established index mark **84** that corresponds to a known reference at the shelving **44**. Movements of the tower assembly **47** are determined and directed by the controller **30** in relation to the index mark **84**. Guide wheels **86** are supported to the base frame **82** and a top frame **88** of the selector **46**. The wheels **86** mount within and follow a grooved track at upper and lower horizontal tracks **90, 92**. The frames **82** and **88** are shown pulled away from the tracks to expose the guide wheels **86**.

The end effect **48** and transfer bin **70** are directed independently along the tower assembly **47** at a pair of tubular metal columns **94** and **96** that extend between the base and top frames **82** and **88**. A vertical drive motor **98** mounted to the base frame **82** drives a second chain **100** that is trained about drive and idler sprockets **102** and **104** aligned to the column **96**. A portion of the chain **100** extends within the column **96** and is secured to the end effect **48** and transfer bin **70**. Vertical drive signals to the motor **98** raise and lower the end effect **48** and bin **70**. Gear motors **74** and **98** are presently used to control the X and Y movements of the transfer assembly **46**. Such motors provide satisfactory positional control to a tolerance on the order of ¼ inch in the X-Y plane and 1/16 inch in the Z plane.

Slide collars **106** and **108** contain the end effect **48** and bin **70** to the columns **94** and **96**. The collars **106** and **108** mount

over the vertical columns **94**, **96** and include internal bearing surfaces that freely slide along the columns **94** and **96** without hampering movement of either the end effect **48** or collection bin assemblies **70**. The end effect **48** is secured to the collar **108** and the collection bin **70** is secured to both of the collars **106** and **108**. The collar **108**, in turn, is secured to the ends of the chain **100** such that the drive motor **98** vertically directs the end effect **48** and bin **70**.

The vertical "Y" drive signals are supplied from the controller **30** to the motor **98**, independent of the horizontal "X" drive signals to the motor **74**, to raise and lower the end effect **48** to an appropriate shelf space and drawer **49** containing an item selected by the user. The controller **30** is continuously programmed with the location and inventory condition of the kiosk **2**. The corresponding X, Y and Z drive signals are determined in relation to the inventory data. The horizontal and vertical drive signals are simultaneously supplied to the respective drive motors **74** and **98** to reduce dispensing time. Alternatively, the X and Y drive signals may be sequentially applied. Analog feedback signals are coupled from the transfer assembly **46** to the controller **30** via potentiometers that are described in more detail below. The drive and feedback signals are presently correlated as voltage dependant signals that are related to the index **84**.

Secondary position confirmation data can be obtained from transducers mounted about the shelving **44** to detect the relative movements of the transfer assembly **46**, end effect **48** and bin **70**. For example, limit switches may be secured to detect relative movement of the transfer assembly **46** and collection bin **70** to the shelving **44**. Photo-optic sensors or a variety of other known motion sensors can be positioned to detect and confirm proper movement of the assemblies **46**, **48** and **70** in relation to the inventory. The inherent accuracy of the stepper motors and closed loop feedback obtained with included potentiometers provides adequate drive tolerances for the present kiosks **2**.

The transfer bin **70** is constructed as an open topped container **72** and includes a wall **110** that is shaped to align to the shelving **44** and sloped to direct selected merchandise to the bottom. A partial front wall **112** assures the selected item does not prematurely fall from the container **72** during transfer to the port **36**. The length of the container **72** is sized to permit substantial extraction of each drawer **49** from the shelving **44**. As a drawer **49** is extended, each interior compartment is exposed to the container **70** and the merchandise falls from the drawer **62** into the container **72**.

The transfer bin **70** secured to the collars **106** and **108** via a pair of side supports **114** and **116** and a pair of extensible slide tracks **118**. The slide tracks **118** extend and retract along the supports **114** and **116** to permit a horizontal extension of the container **72** into abutment with the shelving **44**.

Once the transfer container **72** is filled with any authorized user selections, appropriate amount of selections, necessary X, Y drive signals convey and align the container **72** to the port **36**. The user can then extract the items. The controller **30** computes the drive signals in relation to current location and inventory data stored in temporary buffers, registers or memories at the controller **30**. The controller **30** selectively manipulates the transfer and end effect assemblies **46** and **48** to each appropriate storage location before sending the container **72** to the port **36**. Individual selections might also be made one at a time. Alternatively, the user can deposit items in the empty container **72** and the container **72** can be directed to a desired location to effect return. A UPC card reader can be included with the kiosk to confirm the return of previously loaned items.

With the sending of the container **72** to an X, Y location immediately behind the port **36**, the container **72** is lowered onto a roller arm **114** that vertically projects from a base support **115** at the dispenser **42**. As the sloped wall **110** engages a pair of rollers **116**, the container **72** is directed toward the port **36**. The slide tracks **118** also facilitate container movement. A return spring (not shown) mounted between the container **72** and side supports **114** and **116** biases container movement to assure the return of the container **72** to a fully retracted position prior to the next selection sequence.

The lateral displacement of the container **72** is required with the kiosk **2** to accommodate the recessed display case **12**. For enclosures that do not provide a recessed display case **12**, lateral bin movement may not be required.

Also mounted to the slide collar **108** is the end effect assembly **48** and which is described in detail at U.S. Pat. No. 5,499,707. An electromagnet **136** is secured to the assembly **48** and cooperates with steel plates **138** secured to the front of each drawer **49**. With the engagement of the magnet **136** to a metal plate **138**, the drawer **49** can be extended and retracted an appropriate distance. The necessary "Z" axis drive signals to the motor **120** are determined in relation to pre-programmed data specific to the drawer dimensions and configuration and current inventory status.

The steel plates **138** are secured to the front wall of each drawer **49** to partially depend below the drawer bottom and engage an edge of the shelving **44**. Each plate **138** therefore also serves as a stop limit to drawer movement as each drawer **49** is re-inserted onto the shelving **44**.

The motor **120** is also operated to take advantage of an inherent tolerance to slippage. That is, the controller **30** slightly over extends the arm **132** as each drawer **62** is engaged and returned to assure good contact between the magnet **136** and plate **138** and between the plate **138** and shelving **44**. Alternatively, an adjustable, resilient linkage might be fitted to the end effect assembly **48** to permit minor adjustments to accommodate movement tolerances and assure a close alignment between the magnet **136** and plate **138** prior to operation of the magnet **136** at the start of each drawer extraction.

A separate drawer withdrawal limit is not presently required, due to the inherent accuracy of the transfer assembly **46** and end effect **48**. Each drawer **49** is presently withdrawn to within ¼ to ⅜ inch of the shelf edge. Depending upon travel tolerances, appropriate controls can be included to prevent over withdrawal of a drawer **49**.

An alternative, hook-type end effect **150** and tray conveyor assembly **152** is shown at FIGS. **3** and **4**. The end effect **150** can be used in lieu of the magnetic end effect **48**. The end effect **150** can be attached alone or in combination with the end effect **48** or any other end effect to any tower assembly **47**. The end effect **150** cooperates with a number of trays of differing sizes that have bottoms **158**. Two specific trays **154** and **156** are shown at FIGS. **5–7**. The width, length and height of each tray **154** and **156** can be designed as desired relative to the space provided at the shelving **44** and each stored item. A projecting lip **160** is provided at each tray **154** and **156**. The lip **160** interconnects with a flanged hook **162** that projects from the end effect **150** and that is lowered over the lip **160** to catch the tray. The shape of the lip **160** and hook **162** can be varied as desired, provided a desired coupling can be made to manipulate the trays **154** and **156** to and fro from the shelve assembly **44**.

The hook **162** extends and retracts along a channel **163** at a platform **164** that is secured to side panels **166** and **168** at

the conveyor assembly **152**. The platform **164** is constructed from two laterally displaced sections **167** and **169** that are separated by the channel **163**. Three slide surfaces A, B and C at different levels are defined by the platform sections **167** and **169** between tapered upright sidewalls **170**, **172** and **174**. The tapered surfaces of the sidewalls **170**, **172** and **174** laterally center each selected tray **154** or **156** as the tray is drawn onto the platform **164** via the hook **162**. As a tray **154** or **156** is extracted from the shelving **44**, the controller **30** directs the platform **164** and supported tray to the port **36**. A user then removes the selected item from the tray. The platform **164** and empty tray is then returned to the storage location, where the tray is pushed via the hook **162** back into position on the shelving **44**.

During a return sequence, the empty tray is re-conveyed to the port **36**, where the user deposits the item. The platform **164** is then re-directed to the storage location and the tray and returned item are pushed via the hook **162** back onto the shelving **44**.

The conveyor assembly **152** determines movement of each tray onto and from the shelving **44** and platform **164**. The movements are effected via a cross member **176** that supports the hook **162** and that is secured to slide blocks **178** of the conveyor assembly **152**. The slide blocks **178** are directed toward and away from the shelving **44** via guide rails **180**, a motor **182**, drive wire **184** or equivalent, idler axle **186** and pulleys **188** attached to the side panels **166** and **168**.

FIG. **2** also shows the tray **154** fitted with a plate **138**. Although not depicted, it is to be appreciated a magnetic end effect **38** and magnet **136** can be secured to the tower **47** and in lieu of a hook **162** to interact with the tray **154** in the same fashion as the bottomless trays **49**. In this instance, the magnet would manipulate a tray **154** onto and off of the platform **164** and conveyor assembly **152**.

In lieu of bottomless and bottom walled drawer storage containers, FIGS. **8** and **9** depict a comb-type storage assembly **190** that cooperates with the magnetic end effect **48**. The comb assembly **190** finds particular application with the pegboard **41** and items mounted thereto. A number of assemblies **190** are typically mounted to the pegboard **41** with conventional rod hangers **192**. A roll pin **194** projects from the hanger a92.

Each assembly **190** includes a pair of displaced horizontal rails **196** and **198**. Presently, the rails **196** and **198** are hollow. The length of the rails **196** and **198** can be sized as desired, although the rail is shown broken. The projecting hanger **192** mounts in the bore of the rail **196** and slips over the roll pin **194** at a provided slot (not shown) in the end piece **193**. The pin **194** acts as a stop to movement of the rail **196** on the hanger **192**. A metal plate **200** is attached to the end of the rail **196**.

A comb member **202** is constructed in a U-shape; see FIG. 9, from a formed nylon material. A longitudinal channel **204** extends the length of the comb **202**. The length of the comb **202** can be formed as desired. A plate **138** is secured to the end of the comb **202** and the comb **202** is supported for reciprocating motion along the rail **198** in the channel **204**. The spacing of the comb **202** from the rail **196** is also such that the comb **202** is restricted from pivoting on the rail **198**. Bagged or carded items are typically mounted in the spaces **206** between the teeth **208** of the comb **202**. The rail **198** is inserted through punched support holes in item packaging.

The metal end plates **200** and **138** generally cooperate with the magnetic end effect assembly **48** as previously described. First however, the magnet **136** interacts with the plate **200** to draw the assembly **190** away from the pegboard **91** a distance determined by the pin **194**. The magnet **136** is then released and lowered to grip the plate **138** and draw the comb **202** forward sufficiently. Items attached to the rail **198** are released from the rail **198** as the rail **198** is drawn into each tooth **208** and the adjacent space **206** is exposed so that the supported item falls into the container **72**.

The foregoing comb assembly **190** can also be adapted to accept returned items. For example, an insert to the container that holds a packaged item in an upright condition and at a height sufficient to align with the rail **198** can be mounted in the container **72**. The user is instructed to appropriately mount the item to the insert. Presuming the packing is flexible, upon returning the dispensed item to a position adjacent the appropriate assembly **190** and manipulating the comb **202** forward, the packaging can be made to flex into a desired space **206** before pushing the comb **202** and packaging back along the rail **198**.

The various alternative operating sequences of the kiosk **2** are shown at the flow charts of FIGS. **11** and **12**. System operation is dependent upon receipt of payment or entry of an assigned pin code. Where items are dispensed on loan, limits can be included to require return of earlier items before additional items are dispensed.

With the selection and payment processes completed, the controller **30** produces the necessary X, Y, Z, drive signals to manipulate the transfer assembly **46** and associated end effect assemblies **48** and **150** relative to the drawers **49**, trays **54** and **56** and/or comb assembly **190** to dispense or return the selected items from and to assigned storage locations.

While the invention has been described with respect to a presently preferred construction and various considered modifications and improvements thereto, still other constructions may also be suggested to those skilled in the art. For example and although several alternative storage devices and cooperating end effects have been described, still others can be constructed that can be accommodated at the drive assembly **46**. The invention should therefore not be narrowly construed to the foregoing description. Rather, the invention should be interpreted broadly within the spirit and scope of the appended claims.

What is claimed is:

1. A self-service kiosk comprising:

(a) a portable multi-walled enclosure surrounding a plurality of shelves and including a port communicating with the exterior of said enclosure, wherein said shelves support a plurality of drawers, and wherein at least one of said plurality of drawers includes a bottom that circumscribes an inventory storage space;

(b) data entry means responsive to a plurality of user identification codes for interactively selecting items of inventory stored in said drawers upon receipt of one of said plurality of codes and data defining each selected inventory item;

(c) drawer coupling means for coupling to each of said plurality of drawers;

(d) inventory transfer means including a support platform for supporting each of said drawers and manipulating each selected drawer between said shelves and said port; and

(d) controller means responsive to said data entry means for conveying said drawer coupling means and inventory transfer means to selected ones of said drawers for axially withdrawing selected ones of said plurality of drawers from said shelves onto said support platform and for conveying said support platform and extracted tray to said port to deliver a stored inventory item.

2. A kiosk as set forth in claim 1 wherein said support platform comprises first and second sections that are laterally displaced from one another, wherein said first and second sections each include a plurality of stepped surfaces of successively increasing height such that each stepped surface exhibits a different elevation, wherein said stepped surfaces of said first and second sections are aligned to define a plurality of planar parallel levels at said stepped surfaces, and wherein each of said plurality of said drawers can be supported at one of said plurality of levels.

3. A kiosk as set forth in claim 2 wherein a sidewall of at least one of said plurality of stepped surfaces at each level exhibits a taper that extends inward toward a sidewall of the adjoining stepped surface such that each drawer is directed to a predetermined orientation on said platform as it is withdrawn from said shelves.

4. A kiosk as set forth in claim 2 wherein the bottom containing drawer includes a lip and wherein said drawer coupling means includes a hook member mounted for reciprocating motion in a space between said first and second sections to grip said lip with said hook and direct the bottom containing drawer onto and off of said platform.

5. A kiosk as set forth in claim 2 wherein said drawer coupling means and inventory transfer means are coupled to first and second endless driven linkages that convey said platform along a plurality of horizontal drive tracks and vertical columns.

6. A kiosk as set forth in claim 2 including means for receiving payment to selected inventory items and wherein said data entry means also permits user selections upon receipt of payment.

7. A kiosk as set forth in claim 2 including means for extracting an empty drawer from said shelves and directing said empty drawer and platform to said port to receive a returned inventory item and re-directing the filled drawer to said shelves and re-inserting the filled drawer and returned inventory item onto said shelves.

8. A kiosk as set forth in claim 1 wherein at least one of said plurality of drawers is bottomless.

9. A kiosk as set forth in claim 3 wherein the bottom containing drawer includes a lip and wherein said drawer coupling means includes a hook member mounted for reciprocating motion in a space between said first and second sections to grip said lip with said hook and direct the bottom containing drawer onto and off of said platform.

10. A kiosk as set forth in claim 2 wherein a sidewall of each of said plurality of stepped surfaces at each level exhibits a taper that extends inward toward the sidewall of an adjoining stepped surface such that each drawer is centered on said platform as it is withdrawn from said shelves.

11. A kiosk as set forth in claim 10 wherein the sidewalls of each of said plurality of stepped surfaces are successively displaced at a greater separation at each level such that each level accommodates drawers of a different width.

12. A self-service kiosk comprising:

(a) a portable multi-walled enclosure surrounding a plurality of shelves and including a port communicating with the exterior of said enclosure, wherein said shelves support a plurality of drawers, and wherein at least one of said plurality of drawers includes a lip and a bottom that circumscribes an inventory storage space;

(b) data entry means responsive to a plurality of user identification codes for interactively selecting items of inventory stored in said drawers upon receipt of one of said plurality of codes and data defining each selected inventory item;

(c) drawer coupling means having a hook for coupling said hook to said lip;

(d) inventory transfer means including a support platform for supporting each of said drawers and manipulating each selected drawer between said shelves and said port, wherein said support platform comprises first and second sections that are laterally displaced from one another, wherein said first and second sections each include a plurality of stepped surfaces of successively increasing height, wherein said stepped surfaces of said first and second sections are aligned to define a plurality of planar parallel levels at said stepped surfaces, wherein said drawer coupling means and inventory transfer means are coupled to first and second endless driven linkages that convey said platform along a plurality of horizontal drive tracks and vertical columns; and

(e) controller means responsive to said data entry means for conveying said drawer coupling means and inventory transfer means to selected ones of said drawers for axially withdrawing selected ones of said plurality of drawers from said shelves onto a selected one of said plurality of levels at said support platform and for conveying said support platform and extracted tray to said port to deliver a stored inventory item or accept the return of an inventoried item.

13. A kiosk as set forth in claim 12 wherein a sidewall of each of said plurality of stepped surfaces at each level exhibits a taper that extends inward toward the sidewall of an adjoining stepped surface such that each drawer is centered on said platform as it is withdrawn from said shelves.

14. A kiosk as set forth in claim 13 wherein the sidewalls of each of said plurality of stepped surfaces are successively displaced at a greater separation at each level such that each level accommodates drawers of a different width.

* * * * *

EXHIBIT D

US006681717B2

(12) **United States Patent**
Burghardi et al.

(10) **Patent No.: US 6,681,717 B2**
(45) **Date of Patent: Jan. 27, 2004**

(54) **COMPUTER SYSTEM FOR DETERMINING A CUSTOMIZED ANIMAL FEED**

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(22) Filed: **Dec. 15, 2000**

(65) **Prior Publication Data**

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(52) **U.S. Cl.** **119/51.02**; 119/52.4
(58) **Field of Search** 119/51.02, 52.4, 119/53, 57.92; 702/19, 179, 181, 182, 183, 184

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(74) *Attorney, Agent, or Firm*—Foley & Lardner

(57) **ABSTRACT**

A method and system for creating a customized animal feed includes having ingredient data from more than one location, animal data, and evaluation data. The specifications for a customized feed are generated using ingredient data representative of the mix of ingredients available at one or more locations. A customized feed is generated which is designed to fulfill the nutritional requirements for the animal's diet. The nutritional requirements are derived from the animal data. Furthermore, the feed is optimized to fulfil the requirements of the evaluation criteria. Evaluation criteria such as (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, are then utilized together with the feed data and animal data to provide a customized feed which has been generated based upon evaluation data which is representative of one or more of the evaluation criteria.

38 Claims, 3 Drawing Sheets

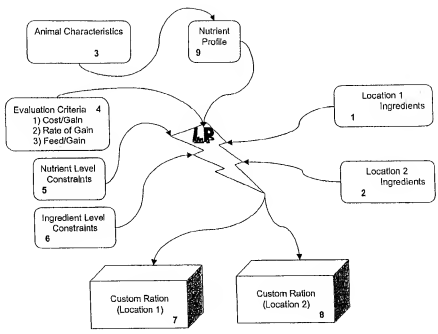
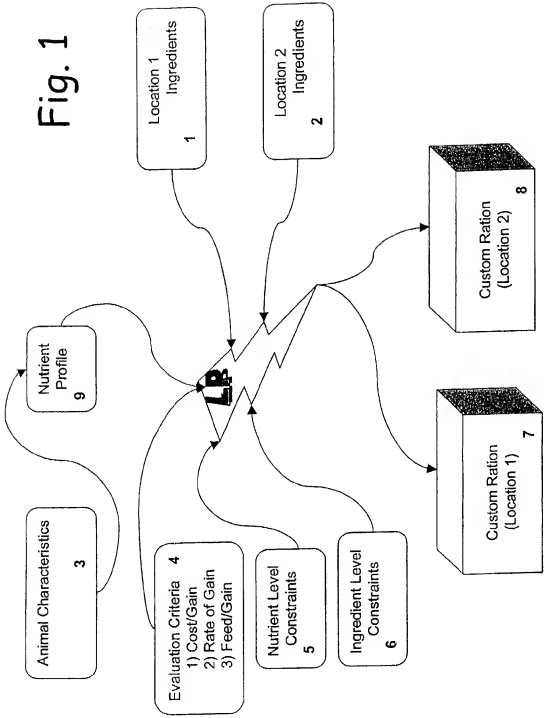


Fig. 1


Location 1 Ingredients 1
Location 2 Ingredients 2
Nutrient Profile 9
Animal Characteristics 3
Evaluation Criteria 4
1) Cost/Gain
2) Rate of Gain
3) Feed/Gain
Nutrient Level Constraints 5
Ingredient Level Constraints 6
LP
Custom Ration (Location 1) 7
Custom Ration (Location 2) 8

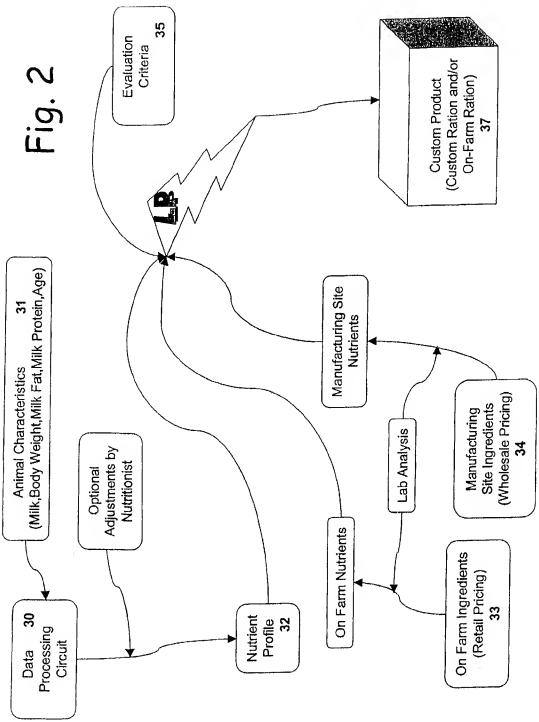
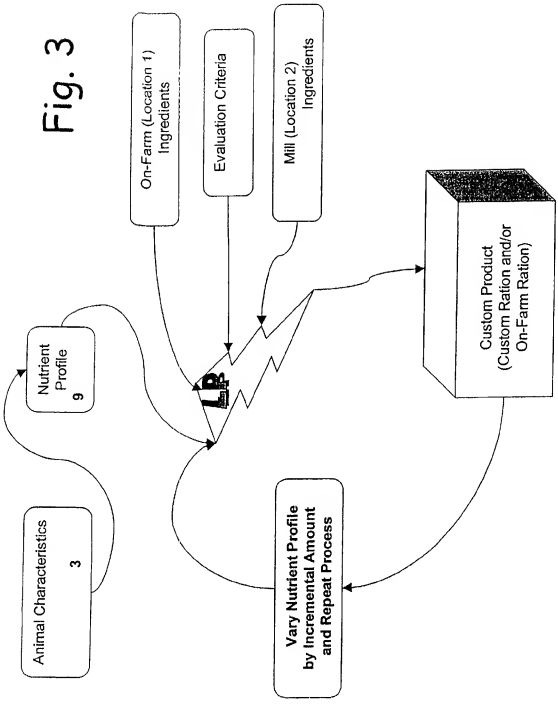

Animal Characteristics (Milk,Body Weight,Milk Fat,Milk Protein,Age) 31
Data Processing Circuit 30
Optional Adjustments by Nutritionist
Nutrient Profile 32
On Farm Nutrients
On Farm Ingredients (Retail Pricing) 33
Lab Analysis
Manufacturing Site Nutrients
Manufacturing Site Ingredients (Wholesale Pricing) 34
LP
Evaluation Criteria 35
Custom Product (Custom Ration and/or On-Farm Ration) 37

Fig. 2

Fig. 3


Animal Characteristics
3
Nutrient Profile
9
On-Farm (Location 1) Ingredients
Evaluation Criteria
Mill (Location 2) Ingredients
LP
Custom Product (Custom Ration and/or On-Farm Ration)
Vary Nutrient Profile by Incremental Amount and Repeat Process

COMPUTER SYSTEM FOR DETERMINING A CUSTOMIZED ANIMAL FEED

FIELD OF THE INVENTION

The present invention relates to a computerized system for determining a customized feed for animals, such as cattle, swine, poultry, fish, crustaceans and the like. In particular, the system determines a feed mix based upon data relating to information such as animal characteristics, available ingredients, speed of product production, and cost of production.

BACKGROUND

In food production, and specifically producing animal products such as milk, beef, pork, eggs, chicken, fish etc., there is need to improve production efficiency. Production efficiency, i.e. producing the maximum quantity of animal products while minimizing the time and cost of production for those products, is important in maintaining a competitive advantage.

A producer (i.e. a farmer, rancher, pork producer, and the like) generally wants to maximize the amount of animal product produced (e.g. gallons of milk, pounds of beef or pork produced) while keeping the costs associated with feed at a low level in order to achieve maximum animal productivity. The maximized amount of animal product should be produced at a minimized cost to the producer. Costs to the producer include the cost of feed needed to produce the animal products, as well as the costs of related equipment and facilities needed in the production of animal products. In order to minimize the effect of fixed costs associated with equipment and facilities, the maximum amount of animal product should preferably be produced in a minimum time period.

Producers are constantly trying to increase these production efficieneies. One way of increasing production effieiencies is by altering the feed which animals are fed. For example, a feed with certain amounts of nutrients can cause an animal to grow or produce animal products quickly and/or perform better, whereas a different feed with different amounts of nutrients may cause an animal to grow or produce animal products on a more cost effective basis.

Current systems for creating animal feed are not fully capable of helping producers evaluate and improve production efficieneies. Current systems commonly generate an overall nutrient profile which is related to a set of animal characteristics. Such systems then look at the overall nutrient profile and compare what nutrients may be had from the on-farm ingredients. From this comparison, a "nutritional gap" can be calculated, i.e., the nutritional requirements that the producer needs to fulfill his production goals after accounting for the use of his on-site feed. This nutritional gap is then compared to the nutritional components which may be available from ingredients located at a supplier's mill. Through a comparison of the nutritional gap and the nutritional components available from the mill, current systems allow a supplier to provide a cost effective custom feed which is optimized to permit an animal to produce desired animal products on a cost minimized basis.

Currently systems exist that are capable of taking the amounts of on-farm ingredients to be used in the overall diet of the animal into account. This is typically done by accounting for the on-farm component of the animal's diet as a fixed input parameter in the determination. It would be advantageous to be able to modify the amounts of on-farm ingredients to be used in forming the custom feed as part of the optimization process. Moreover, current systems are generally limited to generating the custom feed based on a single evaluation criteria, typically based on the cost of the feed (e.g., on a cost of feed per unit of animal weight gain basis). It would be advantageous to have a system which is capable of utilizing more than one evaluation criteria in generating the custom feed.

SUMMARY

One embodiment of the present invention provides a system for determining customized feed for animals, such as farm livestock, poultry, fish and crustaceans. The system stores animal data representative of the characteristics of the animal, feed data representative of the feed ingredients located at one or more locations, and evaluation data representative of at least one evaluation criteria. The evaluation criteria are generally related to factors representative of animal productivity. Examples of evaluation criteria include (i) animal production rate (e.g., the rate of animal weight gain or the rate of production of a food product such as milk or eggs); (ii) cost of feed per unit animal weight gain; and (iii) feed weight per unit animal weight gain. The system includes a data processing circuit, which may be one or more programmed microprocessors, in communication with a data storage device or devices which store the data. The data processing circuit is configured to generate profile data representative of a nutrient profile for the animals based upon the animal data. In effect, the nutrient profile is a description of the overall diet to be fed to the animals defined in terms of a set of nutritional parameters ("nutrients"). Using the profile data, the data processing circuit generates ration data representative of a combination of ingredients from one or more locations. The ration data is generated by the data processing circuit based upon the profile data, the feed data and the evaluation data.

Another embodiment of the system includes processing means for generating the profile data representative of a nutrient profile for the animals based upon the animal data. Using the profile data the data processing means generates ration data representative of a combination of ingredients from one or more locations. The ration data is generated by the data processing means based upon the profile data, the feed data and the evaluation data.

Another embodiment of the present invention provides a method for determining customized feed for one or more animals. The method includes storing animal data representative of the characteristics of the animal, storing feed data representative of the feed ingredients located a first location (e.g., on farm), storing second feed data representative of the feed ingredients located at a second location (e.g., at a supplier's mill), and storing evaluation data representative of one or more evaluation criteria. Profile data representative of a nutrient profile for the animal is generated based upon the animal data. Using the profile data, ration data representative of a combination of ingredients from one or more locations is generated based upon the profile data, feed data and evaluation data.

Another embodiment of the present invention provides customized feed produced by a process. The process includes storing animal data representative of the characteristics of the animal, feed data representative of the feed ingredients located a location, storing second feed data representative of the feed ingredients located at a second location, and storing evaluation data representative of at least one evaluation criteria. Profile data representative of a

nutrient profile for the animal is generated based upon the animal data. Using the profile data, ration data representative of a combination of ingredients from the location is generated based further upon feed data and the evaluation data.

A further embodiment of the present invention provides a food product produced from an animal fed a customized feed. The food product is produced by a method which includes storing animal data representative of the characteristics of the animal, feed data representative of the feed ingredients located at a location, storing second feed data representative of the feed ingredients located at one or more additional locations, and storing evaluation data representative of at least one evaluation criteria. Profile data representative of a nutrient profile for the animal can be generated based upon the animal data. Using the profile data, ration data representative of a combination of ingredients from one or more of the locations is generated based further upon the feed data and evaluation data. The combination of ingredients is fed to the animal and the animal is appropriately processed to produce the desired food (e.g., a food product such as milk or eggs may be recovered from the animal or the animal may be slaughtered to provide meat for consumption by humans and/or other animals).

As modifications to the embodiments described herein, systems and/or methods may rely on more than one optimizing criteria and/or feed data representative of ingredients located at more than one location. For example, ingredients which could be used to create the ration may be located at the farm associated with the animals as well as at the mill of an ingredient supplier. Depending upon the requirements of the system, processing can be consolidated in one processor or divided between processors in communication via a network such as a LAN or the Internet. Furthermore, the processors may be located in devices such as workstations, portable PC's and/or hand held computers.

In other variations of the embodiments described herein, the systems and/or methods may further include a memory portion in communication with the digital processor which stores variation data representative of a range for one or more nutrients of the nutrient profile. The digital processor is capable of generating a set of ration data based upon the variation data. A memory portion of the system may store variation data which corresponds to preselected incremental variations for the values assigned to one or more individual nutrients in the nutritional profile.

Throughout this application, the text refers to various embodiments of the system and/or method. The various embodiments described are meant to provide a variety of exemplary examples and should not be construed as descriptions of alternative species. Moreover, it should be noted that the descriptions of the various embodiments provided herein may be of overlapping scope. The embodiments discussed herein are merely illustrative and are not meant to limit the scope of the present invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a general schematic representation of the data flow in one embodiment of the present System.

FIG. **2** is a general schematic representation of the data flow in another embodiment of the System which is designed to be used to generate a custom product ("Custom Ration") and/or feed mix from on-site ingredients ("On-Farm Ration") optimized for milk production and/or quality.

FIG. **3** is a general schematic representation of the data flow in a variation of the System shown in FIG. 1.

DETAILED DESCRIPTION

An exemplary system, and process which can be used in producing a customized feed for animals, such as livestock, poultry, fish or crustaceans is described herein. How the system and process can increase production efficiencies by customizing feed is also disclosed. It is particularly desirable if the system and methods are capable of determining an optimized feed using one or more evaluation criteria. Examples of suitable evaluation criteria include a feed cost per unit animal weight gain basis, an animal production rate basis (e.g., based upon a rate of animal weight gain or a rate of production of an animal product, such as milk or eggs), and a feed amount per unit of animal weight gain basis.

In one embodiment of the present system, a computer system may be used which has a processing unit that executes sequences of instructions contained in memory. More specifically, execution of the sequences of instructions causes the processing unit to perform various operations, which are described herein. The instructions may be loaded into a random access memory (RAM) for execution by the processing unit from a read-only memory (ROM), a mass storage device, or some other persistent storage. In other embodiments, hardwired circuitry may be used in place of, or in combination with, software instructions to implement the present method. Thus, the embodimcats described herein are not limited to any specific combination of hardware circuitry and/or software, nor to any particular source for the instructions executed by the computer system.

Creating a customized feed typically involves processing and manipulating at least four basic data sets (see, e.g., FIG. 1): first feed data representative of the collection of ingredients located at a first location **1**, second feed data representative of the collection ingredients located at a second location **2**, animal data representative of characteristics of the animal **3** (e.g., parameters related to its genotype, production level, environment and/or feeding regime), and evaluation criteria **4**. As will be explained below, very often first and second feed data representative of sets of ingredients located at an on-farm site (first ingredients **1** located at a first location) and ingredients located at a supplier's mill site (second ingredients **2** located at a second location) are used to generate the recommended mix of ingredients to be fed to the animal. In many instances, the ration data define an overall diet for the animal which includes custom rations from more than one location (e.g., a custom ration from a first location **7** and a custom ration from a second location **8** as depicted in FIG. **1**). These can be combined to create a customized feed ("ration") which fulfills the animal data requirements while meeting the evaluation criteria **4**. The evaluation criteria may be chosen from such suitable criteria related to animal productivity as (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain.

In some modified embodiments, the present system may include additional memory portions for storing nutrient level constraints **5** and/or ingredient level constraints **6**. This may be useful where, for example, it has been established that higher levels of certain nutritional components could pose a risk to the health of an animal being fed the custom feed. For example, if the custom feed includes some trace minerals, such as selenium, present in too great an amount, the custom feed may have adverse health consequences to the animal. Various embodiments of the present invention allow constraints to be placed on the maximum and/or minimum amounts of one or more nutrients in the profile data generated. In some embodiments, this may be used together with the animal data as a basis to calculate the profile data. These constraints may be stored in a memory location as part of the system or the system may permit an individual operator to input one or more constraints on the amount of particular

nutrient(s) in the profile data generated by the system. Similarly, it may be desirable to limit the amounts of one or more ingredients in either a custom product mix or in the overall diet to be fed to the animal. For example, for ease of formulation of a custom feed in pellet form it may be desirable to limit the amount of certain ingredients and/or require the inclusion of minimum amounts of specified ingredients.

The first data set that is generally input into the system and subsequently stored in a memory portion includes data representative of characteristics of the animal. Examples of types of data representative of animal characteristics ("animal data") include beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal. For example, the nutrient profile generated for a particular animal can vary based upon a number of different characteristics of the animal relating to one or more of its genotype, environment, current condition (e.g., defined in terms of health and/or weight), desired production level, feed form (e.g., meal or pellet), current production level, desired final condition (e.g., defined in terms of final weight and/or relationship of animal muscle to fat of the animal) and the like. Tables 1 and 2 below list illustrative sets of animal characteristics which can be used as a basis to generate nutritional profiles to be used in designing custom rations ("custom feeds") for swine and dairy cattle, respectively.

TABLE 1

Animal Characteristics Suitable for Generating a Nutritional Profile for a Feed for Swine

Animal Category	Genotype (lean gain)
Finisher	Effective Ambient Temperature
Gilt Replacement	Temperature
Grow	Draft
Prebred	Bedding
Sow	% of pigs that are wet)
Gestation	Pigs per pen
Lactation	Pig density (square feet per pig)
Artificial Insemination Boar	Health
Begin Weight	Flooring Type
End Weight	Total pigs born/litter
Feed Disappearance (Intake)	Litter weight gain
Feed Wastage	Total pigs born/litter
Feed Form	

TABLE 2

Animal Characteristics Suitable for Generating a Nutritional Profile for Dairy Cattle

Target Milk Weight (volume)	Body Weight
Target Milk Butterfat %	Body Weight Change
Target Milk Protein %	Body Condition Score (current)
Current Milk Weight (volume)	Body Condition Score (desired)
Current Milk Butterfat %	Actual Dry Matter Intake
Current Milk Protein %	Environmental Temperature
Percent of group in first lactation	Environmental Humidity
Percent of group in second lactation	Genotype

The animal data representative of the characteristics of the animal may be inputted into a computer system with a memory portion available and configured to store the data. The animal data representative of the characteristics of the animal may be inputted into the system by a variety of methods known to those skilled in the art including a keyboard, mouse, touchpad, computer, internet or other related device.

The system includes a data processing circuit which is configured to generate profile data representative of a nutrient profile for the animals based upon the animal data. In effect, the nutrient profile is a description of the overall diet to be fed to the animals defined in terms of a set of nutritional parameters ("nutrients"). Depending on the desired degree of sophistication of the system, the profile data may include a relatively small set of amounts of nutrients or large number of amounts of nutrients. Table 3 includes an illustrative list of nutrients that may be used delineating profile data for animals such as pigs and dairy cattle. Of course, the list of nutrients used in generating profile data may differ for different types of livestock or other animals. Tables 4 and 5 respectively contain lists of nutrients suitable for use in generating nutritional profiles for swine and dairy cattle, respectively.

The data processing circuit in the present system is also configured to generate ration data representative of a combination of ingredients from one or more locations. The ration data is generated by the data processing circuit based upon the profile data, feed data representative of the feed ingredients available at the location(s) and evaluation data representative of one or more evaluation criteria.

TABLE 3

Nutrients Suitable for Generating a Nutritional Profile

Animal Fat	Rumen Nfc
Ascorbic Acid	Salt
Biotin	Selenium
Cal/Phos	Simple Sugar
Chloride	Sodium
Choline	Sol Rdp
Chromium	Sulfur
Cobalt	Sw Obs Me
Copper	Thiamine
Arginine (Total and/or Digestible)	Total Rdp
Cystine (Total and/or Digestible)	Verified Adf
Isoleucine (Total and/or Digestible)	Verified Ash
Leucine (Total and/or Digestible)	Verified Calcium
Lysine (Total and/or Digestible)	Verified Dry Matt
Methionine (Total and/or Digestible)	Verified Fat
Phenylalanine (Total and/or Digestible)	Verified Fiber
Threonine (Total and/or Digestible)	Verified Hemi
Tryptophan (Total and/or Digestible)	Verified Moisture
Valine (Total and/or Digestible)	Verified Ndf
Folic Acid	Verified Neg
Phosphate	Verified Nel
Iodine	Verified Nem
Iron	Verified Nfc
Lactose	Verified Phos
Lasalocid	Verified Protein
Magnesium	Verified Rup
Manganese	Vitamin A
Monensin	Vitamin B12
Niacin	Vitamin B6
Potassium	Vitamin D
Protein	Vitamin E
Pyridoxine	Vitamin K
Rh Index	Zinc
Riboflavin	
Rough Ndf	
Rum Solsug	

TABLE 4

Nutrients Suitable for Generating a Nutritional Profile for Swine

Biotin	True Swine Digestible Isoleucine
Cal/Phos	True Swine Digestible lysine

TABLE 4-continued

Nutrients Suitable for Generating a Nutritional Profile for Swine	
Choline	True Swine Digestible methionine
Copper Add	True Swine Digestible threonine
Folic Acid	True Swine Digestible tryptophan
Iodine Add	True Swine Digestible valine
Iron Add	V Calcium
Mang Add	V Phos
Niacin	V Protein
Pantotuc	Vit A
Pyridoxine	Vit D
Riboflavin	Vit B
Salt	Vit K
Selenium Add	Vitamin B12
Sodium	Zinc
Sw Digphos	
Thiamine	

TABLE 5

Nutrients Suitable for Generating a Nutritional Profile for Dairy Cattle	
Acid Detergent Fiber	Non-Protein Nitrogen
Biotin	Phosphorus
Calcium	Potassium
Chloride	Protein
Cobalt	Rumen Degradable Protein
Copper	Rumen Undegraded Alanine
Dietary Cation Anion Difference	Rumen Undegraded Histidine
Digestible Neutral Detergent Fiber	Rumen Undegraded Isoleucine
Dry Matter	Rumen Undegraded Leucine
Fat	Rumen Undegraded Lysine
Intestinally Digestible Arginine	Rumen Undegraded Methionine
Intestinally Digestible Histidine	Rumen Undegraded Phenylalanine
Intestinally Digestible Isoleucine	Rumen Undegraded Protein
Intestinally Digestible Leucine	Rumen Undegraded Tryptophan
Intestinally Digestible Lysine	Rumen Undegraded Valine
Intestinally Digestible Methionine	Salt
Intestinally Digestible Phenylalanine	Selenium
Intestinally Digestible Threonine	Sodium
Intestinally Digestible Tryptophan	Soluble Protein
Intestinally Digestible Valine	Soluble Sugar
Iodine	Starch
Iron	Sulfur
Magnesium	Verified Net Energy for Lactation
Manganese	Vitamin A
Neutral Detergent Fiber	Vitamin D
Neutral Detergent Fiber from	Vitamin E
Roughage	Zinc
Niacin	
Non Fiber Carbohydrates	

Evaluation criteria are typically related to factors representative of animal productivity and reflect an aspect of production a producer would like to optimize. The present system allows a producer to select evaluation criteria (e.g. cost/gain, cost/output, animal production rate, and/or feed/gain) which fits the producer's production goals. For example, a dairy producer may focus on the cost of feed required to produce a unit of output (cost/output), whereas a pork producer may focus on cost/gain or rate of gain.

Examples of suitable animal production criteria which may be used as evaluation criteria in the generation of ration data include (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain. The animal production rate may simply be a measure representative of the rate of weight gain of the animal in question (rate of gain). For example, a pork producer may wish to optimize rate of gain by selecting a feed which maximizes the rate at which a pig gains weight. This could be selected if a pig farmer was interested in turning over production as quickly as possible in a fixed asset which has limited space. The evaluation data may include data representative of the cost of feed required to produce a unit of weight gain of the animal ("cost/gain" basis). For example, a pork producer may wish to optimize cost/gain by selecting a feed which minimizes the feed cost required to make a pig gain a unit of weight. The evaluation data can include data representative of the amount of feed required to produce a unit of gain (feed/gain). For example, a producer may wish to optimize the feed/gain by selecting a feed which minimizes the amount of feed required to produce a unit of gain. A producer might select this criterion if they were faced with feed storage space constraints.

Examples of other suitable animal production rates which may be used as an evaluation criteria include rates of production of food products, such as milk or eggs, from the animal. Other suitable evaluation criteria include the cost of feed required to produce a unit of output of a particular animal product ("cost/output"). For example, a milk producer may wish to optimize the cost/output by selecting a feed which minimizes the cost of feed required to produce a unit of milk. In addition to utilizing evaluation data representative of only a single evaluation criteria, the present system may be capable of using evaluation data representative of a combination of two or more evaluation criteria in generating the ration data. For example, when considering an appropriate feed, a producer may wish to generate a custom feed based on the rate of production as well as cost of the feed (typically on a cost/gain basis).

Furthermore, the producer may choose to weight the relative contributions of two or more evaluation criteria. The system may include a data processing circuit which generates ration data based in part upon a weighted average of more than one evaluation criteria. In one specific embodiment, the system generates ration data based in part upon a 70:30 weighted average of two evaluation criteria (primary and secondary), such as a combination of cost of feed per unit animal weight gain and animal production rate. The system may also allow a user to alter the relative weighting accorded to the various evaluation criteria selected.

For instance, in the example referred to above, the producer may want to generate ration data using a combination of evaluation criteria that is weighted 70% on a cost/gain basis and 30% on a rate of animal weight gain basis. One method for providing such a weighted optimization analysis is to generate one solution for ration data using cost/gain as the sole evaluation criteria and generating a second for ration data using rate of animal weight gain as the sole evaluation criteria. Ration data which is representative of the weighted combined solution can be achieved by summing 70% of the amounts of ingredients from the cost/gain ration data set and 30% of the amounts of ingredients from the rate of gain ration data set. For example, in the instance where cost/gain ration data (generated solely on a cost/gain basis) includes 10% dehulled corn meal, and rate of gain ration data (generated solely on a rate of gain basis) includes 15% dehulled corn meal, if a producer chose cost/gain as the primary evaluation criteria the ingredient mix in the diet will include roughly 70% of the 10% dehulled corn meal requirement, and 30% of the 15% dehulled corn meal requirement summed to produce the amount of dehulled corn meal in the overall diet (i.e., circa 11.5% dehulled corn meal). This weighted summation is then repeated for all the amounts of ingredients present in the two custom diets generated by the two approaches. As one skilled in the art will recognize, there are other methods of generating ration

data based on a weighted combination of evaluation criteria. The present system can also be configured to generate ration data based on other weightings of combinations of two or more evaluation criteria (e.g., two evaluation criteria weighted on either a 60:40 or 80:20 basis). In some embodiments of the present system, the weighting factors assigned to various evaluation criteria can themselves be input parameter(s) chosen by a producer to reflect the needs of his/her particular situation.

FIG. **2** depicts the general flow of data in one embodiment of the present system. The system shown in FIG. **2** includes a data processing circuit **30** configured to generate a nutrient profile **32** based on the animal data **31** and optional adjustments which may be provided by a nutritionist. Other data processing circuits generate lists of nutrient amounts associated with individual ingredients available at an on-farm site **33** and manufacturing site **34**. A data processing circuit **36**, which includes a linear program generates a custom product based on evaluation criteria **35**. The linear program typically also generates the custom product solution based on pricing data associated with both the on-farm and manufacturing site ingredients. In one embodiment, retail and wholesale pricing information may be normalized to allow the linear program to facilitate consideration of potential ingredients with different types of associated prices as the basis for a solution to a single multivariable problem. The linear program is a mathematical model capable of solving problems involving a large number of variables limited by constraints using linear math functions. A variety of different linear programs capable of solving problems of this type are known to those of skill in the art. One example of a program of this type is commercially available from Format International as part of computer software system for solving complicated multivariable problems.

Memory portions of the systems which store animal data, evaluation data, and feed data representative of on-hand ingredients and/or mill ingredients are in communication with a data processing unit capable of generating ration data. The data processing unit can include a data processing circuit or a digital processing circuit. The memory portions which store the animal data, feed data for on-hand and mill ingredients, and evaluation data may be in communication with the data processing unit by inputted keyboard commands, mouse commands, a network connection with another computer, personal data assistants, via a modem connection, via an internet, or via an intranet.

Data processing circuit(s) which include the linear program can take input data (e.g., profile data, feed data, evaluation data and ingredient constraint data) as a basis to compute ration data. Ration data includes data specifying a combination of ingredients solution which is solved to fulfill a desired nutrient profile based on one or more evaluation criteria. Ration data generated by the present system generally includes data representative of the types and amounts of ingredients to be used to provide an overall custom diet for an animal. The ration data provided by the system generally also specifies a solution that is described in terms of a combination of types and amounts of ingredients from a first location (e.g., an on-farm location) and types and amounts of ingredients from at least one additional site (e.g., one or more supplier locations). Where the overall set of potential ingredients includes ingredients located at more than one location, the custom feed specified by the ration data may be made of ingredients located at either a single location or from more than one location. For example, the ration data may define a custom feed made up from ingredients located solely at supplier location or made up from ingredients located at both an on-farm location and a supplier location.

The ration data generally include custom feed data representative of a combination of amounts of the feed ingredients. The custom feed data may specify the type and corresponding amounts of the ingredients to be used in formulating the overall diet of an animal. This may be made up from a set of ingredients available at more than one location, e.g., from ingredients available at a producer's site and as well as ingredients available at a supplier location. The present system may also provide custom feed data which specifies the types and amounts of ingredients to be used from individual locations. For example, the custom feed data may include a listing of the types and amounts of ingredients available at a first location (e.g., on-farm ingredients) to be used to form a first feed mix and a listing of the types and amounts of ingredients available at a second location (e.g., ingredients available at a supplier location) to be used to form a second feed mix. In such instances, the custom feed data will typically also specify the amounts of the first and second feed mixes that are to be used to make up the overall custom diet for an animal.

The ration data typically includes amounts of a variety of types of ingredients. The actual ingredients available at any particular location can vary over time and will generally vary on a regional basis as well as reflect the type of animal feed that is typically produced and/or stored at the particular site. Commonly, the ration data include feed data representative of amounts of ingredients from a number of different ingredient categories, such as a grain source, a protein source, a vitamin source, a mineral source (e.g., a macro-mineral source and/or a trace mineral source) and/or a fat source. Table 6 includes a list of exemplary ingredients suitable for use in formulating custom feed mixes for a variety of animals. Tables 7, 8 and 9 include lists of ingredients which may be used in generating custom feed products for swine or dairy cattle.

TABLE 7

Ingredients Suitable for Use in Producing a Custom Feed for a Finishing Diet for Swine

Alimet	Linseed Meal
Bakery Product	L-Lysine HCl
Beet Pulp	Lt Barley
Brewers Rice	L-Threonine
Brown Sugar	Malt Sprouts
Calcium Carb	Meat And Bone Meal
Cane Sugar	Menhaden Fish
Canola Meal	Molasses
Cereal Fines	Mono-Dical Phos
Cg Feed	Monosod Phos
Choline	Oat Mill Byproducts
Copper Sulfate	Oat Mill Byproducts
Cora - Ground Fine	Oats - Ground
Cora Gluten Meal	Oats - Rolled
Corn Oil	Pork Bloodmeal
Corn Starch	Safflower Meal
Dehydrated Alfalfa	Salt
Distillers Grains With Soil	Selenium
Dried Potato Waste	Soybean Hulls
Dynasol	Soybean Meal
Fat	Soybean Oil
Fat Sprayed	Sunflower
Feather Meal	Tryptosin
Feeding Rate	Wheat Midds
Fish Meal	

TABLE 8

Ingredients Suitable for Use in Producing a Custom Feed for Breeding Swine

Aliment	Methionine
Animal Fat	Mineral Oil
Ascorb Acid	Molasses-Case
Bakery Product	Mono-Dicalcium Phosphate
Bentonite	Oat Hulls
Blood Meal - Beef/Pork	Red Flavor
Calcium Carbonate	Rice Bran
Cereal Fines	Salt
Choline Chloride	Selenium
Copper Sulfate	Soybean Hulls
Corn Germ Meal	Threonine
Corn Gluten Feed	Tryptophan
Distillers Grains With Solubles	Vitamin E
Dry Methionine Hydroxy Analog	Wheat Midds
Fish Meal	Wheat Starch
Malt Sprouts	Zinc Oxide
Meat And Bone Meal; Pork Carcass	Zinc Sulfate

TABLE 9

Ingredients Suitable for Producing a Custom Feed for Dairy Cattle

Calcium Carbonate	Salt
Copper Sulfate	Selenium
Corn Gluten Meal	Sodium Sesquicarbonate
Fat	Soybean Hulls
Magnesium Oxide	Soybean Meal
Meat And Bone Meal, Pork	Trace Minerals
Mono-Dical Phos	Urea
Niacin	Vitamin-E
Pork Blood Meal	Wheat Midds
K/Mg/Sulfate	Zin-Pro
Yeast	

When feeding animals, producers may not be able to satisfy nutritional requirements of the animals solely using on-hand ingredients (e.g., on-farm ingredients). To satisfy the animal's nutritional requirements, producers may desire to use on-hand ingredients in conjunction with a custom feed product made up of feed ingredients available from an outside supplier, such as a mill, feed mixer, and the like. The outside supplier will commonly have a range of ingredients available or on hand in their inventory (e.g., corn in various forms, soybean meal, wheat mids, barley, oats, animal fat, various vitamin supplements).

In addition to data specifying the types and amounts of ingredients to be used to provide the overall custom diet for an animal, the ration data generated by the present system can also include other data associated with the overall custom diet. Examples of such other data include cost data representative of a cost associated with the custom feed data, feed weight data representative of a feed weight associated with the custom feed data, and performance data representative of projected animal performance associated with the custom feed data. For example, Table 10 below lists a number of categories of ration data that may be useful in assisting a producer and/or supplier in evaluating a custom feed with respect to productivity, animal performance and cost effectiveness. The availability of these types of information can provide a producer and/or supplier with additional information concerning the effects of variations in dietary composition on factors such as cost, volume of feed, wastage and animal performance. As with the listing(s) of the types and amounts of ingredients, the cost data and feed weight data can be representative of costs and feed weights associated with the overall custom diet and/or with feed mix(es) to be provided from individual locations.

TABLE 10

Illustrative Categories of Ration Data Associated with a Custom Feed for Swine

End Weight	Lean Gain
Days in Phase	Lean %
Avg Daily Gain	Effective Ambient Temp
Avg Daily Feed Intake	Cost of Gain
Total Feed Consumed	Total Cost per phase
Feed/Gain	

In other variations of the embodiments described herein, the systems and/or methods may also include a memory portion in communication with the digital processor which stores variation data representative of a range for one or more nutrient components of the nutrient profile. The digital processor is capable of generating a set of ration data based upon the variation data. The memory portion may store variation data which correspond to preselected incremental variations for the values assigned to one or more individual nutrients in the nutritional profile. For example, memory portion may store variation data which correspond to preselected incremental positive and negative variations of the values assigned to two individual nutrients, such as true digestible lysine and net energy. The digital processor would generate ration data corresponding to each of the eight possible additional combinations of values for the two specified nutrients. Together with the ration data associated with the original nutritional profile, the resulting set of nine ration data corresponding to the various combinations of values for each specified nutrient (original value, original value plus an increment; original value minus an increment) would make up a three by three matrix of ration data. One example of this approach is illustrated in Table 11 below. A general approach to generating a set of ration data based upon variation data is depicted schematically in FIG. **3**. The determination of ration data for the center point in the matrix ("Ration Data 5") corresponds to the solution generated by the data processing circuit based on the nutrient profile. In the example shown in Table 11, the nutrient profile has values of 0.90% for true digestible lysine and 2150 kcal/kg for net energy. Each of the eight other ration data in the set depicted in Table 11 corresponds to a ration data generated for a modified nutrient profile in which the value for at least one nutrient has been varied by a specified increment. For example, Ration Data 1 represents ration data associated with a modified nutrient profile has values of 0.95% for true digestible lysine and 2100 kcal/kg for net energy. Ration Data 6 represents ration data associated with a modified nutrient profile in which only the value for true digestible lysine (0.85%) has been varied from the values in the nutrient profile. The generation of such a matrix can facilitate an evaluation of the effect of incremental variations in amounts of specified nutrient(s) on the assessment of optimum ration data for a given evaluation criteria.

TABLE 11

Net Energy (kcal/kg)	True Digestible Lysine 0.95%	0.90%	0.85%
2100	Ration Data 1	Ration Data 2	Ration Data 3
2150	Ration Data 4	Ration Data 5	Ration Data 6
2200	Ration Data 7	Ration Data 8	Ration Data 9

The invention has been described with reference to various specific and illustrative embodiments and techniques.

However, it should be understood that many variations and modifications may be made while remaining within the spirit and scope of the invention.

TABLE 6

Exemplary Ingredients Suitable for Use in Formulating Custom feed Mixes

Acidulated Soap Stocks	Beef Peanut Meal	Citrus Pulp
Active Dry Yeast	Beet	Clopidol
Alfalfa Meal	Beet Pulp	Cobalt
Alfalfa Meal	Biotin	Cobalt Carbonate
Alfalfa-Dehydrated	Biscuit By Product	Cobalt Sulfate
Aliment	Black Beans	Cocoa Cake
Alka Culture	Blood-Flash Dry	Cocoa Hulls
Alkaten	Blueprint Rx	Copper Oxide
Almond Hulls	Bone Meal	Copper Sulfate
Ammonium Chloride	Brewers Rice	Corn Chips
Ammonium Lignin	Brix Cane	Corn Chops
Ammonium	Buckwheat	Corn Coarse Cracked
Polyphosphate	Bugs	Corn- Coarse Ground
Ammonium Sulfate	Cage Calcium	Corn Cob-Ground
Amprol	Calcium Cake	Corn Distillers
Amprol Ethopaba	Calcium Chloride	Corn Flint
Anhydrous Ammonia	Calcium Formate	Corn Flour
Appetein	Calcium Iodate	Corn Germ Bran
Apramycin	Calcium Sulfate	Corn Germ Meal
Arsanilic Acid	Calcium Prop	Corn Gluten
Ascorb Acid	Calf Manna	Corn- High Oil
Aspen Bedding	Canadian Peas	Corn Kibleta
Availa	Cane-Whey	Corn Meal Dehulled
Avizyme	Canola Cake	Corn Oil
Bacitracin Zinc	Canola Fines	Corn Residue
Bakery Product	Canola Meal	Corn Starch
Barley	Canola Oil	Corn/sugar Blend
Barley Crimped	Canola Oil Blender	Corn-Cracked
Barley-Ground	Canola Oil Mix	Corn-Crimped
Barley-Hulless	Canola Screenings	Corn-Ground Fine
Barley-Hulls	Canola-Whole	Corn-Ground Roasted
Barley-Midds	Carbadox	Corn-Steam Flaked
Barley-Needles	Carob Germ	Corn-Steamed
Barley-Rolled	Carob Meal	Corn-Whole
Barley-St. Bon.	Cashew Nut By Product	Cottonseed Culled
Barley-Whole	Catfish Offal Meal	Cottonseed Hull
Barley-With Enzyme	Choline Chloride	Cottonseed Meal
Baymag	Chromium Tripicolinate	Cottonseed Oil
Beef Peanut Hulls	Green Dye	Milo-Cracked
Cottonseed Whole	Green Flavor	Milo-Whole
Coumaphos	Guar Gum	Mineral Flavor
Culled Beans	Hard Shell	Mineral Oil
Danish Fishmeal	Hemicellulose Extract	Mixed Blood Meal
Decoquinate	Hemp	Molasses
Dextrose	Herring Meal	Molasses Blend
Diamond V Yeast	Hominy	Molasses Dried
Disodium Phosphate	Hygromycin	Molasses Standard
Distillers Grains	Indina Soybean Meal	Beet
Dried Apple Pomace	Iron Oxide-Red	Molasses Standard
Dried Brewers Yeast	Iron-Oxide Yellow	Cane
Dried Distillers Milo	Job's Tear Broken Seeds	Molasses-Pellet
Dried Porcine	Kapok Seed Meal	Mold
Dried Whole Milk	Kelp Meal	Monensin
Powder	Kem Wel	Monoammonium Phos
Durnlass	Lactose	Monosodium Gluta-
Enzyme Booster	Lauvdex	mate
Epsom Salts	Lasalocid	Monosodium Phos-
Erythromycin	Lewana Hcl	phate
Extruded Grain	Limestone	Mung Bean Hulls
Extruded Soy Flour	Linco	Mustard Meal High
Fat	Lincomix	Fat
Feather Meal	Lincomycin	Mustard Oil
Feeding Oatmeal	Linseed Meal	Mustard Shorts
Fenbendazole	Liquid Fish Solubles	Narasin
Fermacto	Lupins	Natuphos
Ferric Chloride	Lysine	Niacin
Ferrou Cabonate	Magnesium	Nicarbazin
Ferrous Carbunate	Magnesium Sulfate	Nitarsone
Ferrous Sulfate	Malt Plant By-Products	Oat Callets
Fine Job's Tear Bran	Manganous Ox	Oat Flour
Fish Meal	Maple Flavor	Oat Groats
Fish	Masonex	Oat Hulls

TABLE 6-continued

Exemplary Ingredients Suitable for Use in Formulating Custom feed Mixes

Flavoring	Meat And Bone Meal	Oat Mill Byproducts
Folic Acid	Meat And Bone Meal	Oat Screenings
French Fry Rejects	Meat Meal	Oat Whole Cereal
Fresh Aromc	Meprou	Oatmill Feed
Fried Wheat Noodles	Methionine	Oats Flaked
Gold Dye	Millet Screenings	Oats-Ground
Gold Flavor	Millet White	Oats-Hulless
Grain Dust	Millet Ground	Oats-Premium
Grain Screening	Milo Binder	Oats-Rolled
Granite Grit	Milo-Coarse Ground	Oats-Whole
Grape Pomace	Rice Bran	Oyster Shell
Paprika Spent Meal	Rice By-Products	Paddy Rice
Parboiled Broken Rice	Fractions	Palm Kernel
Pea By-Product	Rice Dust	Papain
Pea Flour	Rice Ground	Papain Enzyme
Peanut Meal	Rice Hulls	Soybean Mill Run
Peanut Skins	Rice Mill By-Product	Soybean Oil
Pelcote Dusting	Rice Rejects Ground	Soybean Residue
Phosphate	Roxarsone	Soybeans Extruded
Phosphoric Acid	Rumen Paunch	Soybeans-Roasted
Phosphorus	Rumensin	Soycorn Extruded
Phosphorus	Rye	Spray Dried Egg
Defluorinated	Rye Distillers	Standard Micro
Pig Nectar	Rye With Enzymes	Peanuts
Plant Waste	Safflower Meal	Starch Molasses
Poloxalene	Safflower Oil	Steam Flaked Corn
Popcorn	Safflower Seed	Steam Flaked Wheat
Popcorn Screenings	Sage Meal	Sugar (Cane)
Porcine Plasma; Dried	Salinomycin	Sulfamex Ormeto
Pork Bloodmeal	Salt	Sulfur
Pozzyme	Scallop Meal	Sulfur
Poxiaxe	Seaweed Meal	Sunflower Meal
Potassium Bicarbonate	Selenium	Sunflower Seed
Potassium Carbonate	Shell Aid	Tallow Fancy
Potassium Magnesium	Shrimp Byproduct	Tallow-Die
Sulfate	Silkworms	Tallow-Mixer
Potassium Sulfate	Sipernate	Tapioca Meal
Potato Chips	Sodium Acetate	Tapioca Promeance
Poultry Blood/Feather	Sodium Benzoate	Taurine
Meal	Sodium Bicarbonate	Terramycin
Poultry Blood Meal	Sodium Molybdate	Thiabenzol
Poultry Byproduct	Sodium Sesquicarbonate	Thiamine Mono
Predispersed Clay	Sodium Sulfate	Threonine
Probios	Solubic	Tiamulin
Procain Penicillen	Soweena	Tilmicosin
Propionic Acid	Soy Flour	Tomato Pomace
Propylene Glycol	Soy Pass	Trace Min
Pyran Tart	Soy Protein Concentrate	Tricalcium Phosphate
Pyridoxine	Soybean Cake	Triticale
Quest Anise	Soybean Curd By-	Tryptophan
Rabon	Product	Tryptosine
Rapeseed Meal	Soybean Dehulled Milk	Tuna Offal Meal
Red Flavor	By-Product	Tylan
Red Millet	Soybean Hulls	Tylosin
Riboflavin		Urea
Vitamin D3		Vegetable Oil Blend
Vitamin E		Virginiamycin
Walnut Meal		Vitamin A
Wheat Bran		Vitamin B Complex
Wheat Coarse Ground		Vitamin B12
Wheat Germ Meal		
Wheat Gluten		
Wheat Meal Shredded		
Wheat Millrun		
Wheat Mix		
Wheat Noodles Low Fat		
Wheat Red Dog		
Wheat Starch		
Wheat Straw		
Wheat With Enzyme		
Wheat-Ground		
Wheat-Rolled		
Wheat-Whole		
Whey Dried		
Whey Permeate		

TABLE 6-continued

Exemplary Ingredients Suitable for Use in Formulating Custom feed Mixes
Whey Protein Concentrate
Whey-Product Dried
Yeast Brewer Dried
Yeast Sugar Cane
Zinc
Zinc Oxide
Zoalene

What is claimed is:

1. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store first feed data representative of the feed ingredients located at a first location;

a third memory portion configured to store second feed data representative of the feed ingredients located at a second location;

a fourth memory portion configured to store evaluation data representative of at least one evaluation criteria; and

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the data processing circuit based upon the profile data, the first and second feed data and the evaluation data.

2. The system of claim **1**, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal.

3. The system of claim **2**, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

4. The system of claim **3**, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

5. The system of claim **1**, wherein the evaluation data is representative of at least two evaluation criteria.

6. The system of claim **5**, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

7. The system of claim **6**, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal.

8. The system of claim **7**, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

9. The system of claim **5**, further comprising a fifth memory portion in communication with the data processing circuit, the fifth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

10. The system of claim **9**, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

11. The system of claim **1**, wherein the memory portions are portions of a digital memory and a parallel data bus is coupled between the digital memory and the data processing circuit to facilitate communication therebetween.

12. The system of claim **1**, wherein the memory portions are portions of a plurality of digital memories and a network couples the digital memories to the data processing circuit to facilitate communication therebetween.

13. The system of claim **1**, wherein the ration data further includes data representative of at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

14. The system of claim **13**, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a sixth memory portion in communication with the digital processor, the sixth memory portion storing variation data representative of a range for the nutrient components of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

15. The system of claim **14**, wherein the nutrient components include at least true digestible lysine and net energy.

16. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store feed data representative of the feed ingredients located at at least one location;

a third memory portion configured to store evaluation data representative of at least two evaluation criteria; and

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the location, the ration data being generated by the data processing circuit based upon the profile data, the feed data and the evaluation data.

17. The system of claim **16**, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

18. The system of claim **17**, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain.

19. The system of claim **16**, further comprising a forth memory portion in communication with the data processing circuit, the forth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

20. The system of claim 19, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

21. The system of claim 16, wherein the ration data further includes at data representative of at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

22. The system of claim 21, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fifth memory portion in communication with the digital processor, the fifth memory portion storing variation data representative of a range for at least one nutrient component of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

23. The system of claim 22, wherein the at least one nutrient component includes at least one of digestible lysine and net energy.

24. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing first feed data representative of the feed ingredients located at a first location;

third memory means for storing second feed data representative of the feed ingredients located at a second location;

fourth memory means for storing evaluation data representative of at least one evaluation criteria; and

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, the processing means generating ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the processing means based upon the profile data, the first and second feed data and the evaluation data.

25. The system of claim 24, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source; and the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

26. The system of claim 24, wherein the evaluation criteria include at least two of a rate of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

27. The system of claim 25, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

28. The system of claim 24, wherein the ration data further includes data representative of at least one (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

29. The system of claim 28, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes fifth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile and the processor means generating a set of ration data based upon the variation data.

30. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing feed data representative of the feed ingredients located at at least one location;

third memory for storing evaluation data representative of at least two evaluation criteria; and

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, processing means further generating ration data representative of a combination of ingredients from the location, the ration data being generated by the processing means based upon the profile data, the feed data and the evaluation data.

31. The system of claim 30, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and the feed ingredients include at least one a grain source, a protein source, a vitamin source, a mineral source and a fat source.

32. The system of claim 31, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

33. The system of claim 31, wherein the ration data further includes diet (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

34. The system of claim 31, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fifth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile; and the processing means generates a set of ration data based upon the variation data.

35. The system of claim 30, further comprising forth memory means for storing optimization weighting data representative of the affect a respective evaluation criteria has on the generation of the ration data, the processing means further generating the ration data based upon the optimization weighting data.

36. A method for determining customized feed for at least one animal, the method comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first location;

storing second feed data representative of the feed ingredients located at a second location;

storing evaluation data representative of at least one evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating first ration data representative of a combination of ingredients from the first location, second ration data representative of a combination of ingredients from the second locations, the ration data being gen-

erated based upon the profile data, the first and second feed data and the evaluation data.

37. The method of claim **36**, wherein the nutrient profile data is representative of at least two nutrient components, the method further comprising the step of generating a set of ration data based upon variation data representative of a range for at least one nutrient component of the nutrient profile.

38. A method for determining customized feed for at least one animal, the method comprising:

storing animal data representative of the characteristics of the animal;

storing feed data representative of the feed ingredients located at at least one location;

storing evaluation data representative of at least two evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating ration data representative of a combination of ingredients from the location, the ration data being generated based upon the profile data, the feed data and the evaluation data.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steven R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15,
Line 15, claims should read:

1. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store first feed data representative of the feed ingredients located at a first location;

a third memory portion configured to store second feed data representative of the feed ingredients located at a second location;

a fourth memory portion configured to store evaluation data representative of at least one evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate nutrient profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the data processing circuit based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the evaluation data is representative of at least two evaluation criteria; and

a fifth memory portion in communication with the data processing circuit, the fifth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

2. The system of claim 1, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal.

3. The system of claim 2, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

4. The system of claim 1, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

5. The system of claim 1, wherein the memory portions are portions of a digital memory and a parallel data bus is coupled between the digital memory and the data processing circuit to facilitate communication therebetween.

6. The system of claim 1, wherein the memory portions are portions of a plurality of digital memories and a network couples the digital memories to the data processing circuit to facilitate communication therebetween.

7. The system of claim 1, wherein the first and second feed data include an amount for each feed ingredient.

8. The system of claim 7, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

9. The system of claim 7, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

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CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steven R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

10. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store first feed data representative of the feed ingredients located at a first location;

a third memory portion configured to store second feed data representative of the feed ingredients located at a second location;

a fourth memory portion configured to store evaluation data representative of at least one evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate nutrient profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the data processing circuit based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fifth memory portion in communication with the digital processor, the fifth memory portion storing variation data representative of a range for the nutrient components of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

11. The system of claim 10, wherein the at least one nutrient component includes at least one of digestible lysine and net energy.

12. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store feed data representative of the feed ingredients located at at least one location;

a third memory portion configured to store evaluation data representative of at least two evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the location, the ration data being generated by the data processing circuit based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain; and

a fourth memory portion in communication with the data processing circuit, the fourth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

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CERTIFICATE OF CORRECTION

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DATED : January 27, 2004
INVENTOR(S) : Steven R. Burghardt et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

13. The system of claim 12, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

14. The system of claim 12, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

15. The system of claim 12, wherein the feed data include an amount for each feed ingredient.

16. The system of claim 15, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

17. The system of claim 15, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

18. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store feed data representative of the feed ingredients located at at least one location;

a third memory portion configured to store evaluation data representative of at least two evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the location, the ration data being generated by the data processing circuit based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fourth memory portion in communication with the digital processor, the fourth memory portion storing variation data representative of a range for at least one nutrient component of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

19. The system of claim 18, wherein the at least one nutrient component includes at least one of digestible lysine and net energy.

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PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steven R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

24. The system of claim 23, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

25. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing feed data representative of the feed ingredients located at at least one location;

third memory for storing evaluation data representative of at least two evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, processing means further generating ration data representative of a combination of ingredients from the location, the ration data being generated by the processing means based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fourth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile; and the processing means generates a set of ration data based upon the variation data.

26. A method for determining customized feed for at least one animal, the method comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first location;

storing second feed data representative of the feed ingredients located at a second location;

storing evaluation data representative of at least one evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating first ration data representative of a combination of ingredients from the first location, second ration data representative of a combination of ingredients from the second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data, wherein the nutrient profile data is representative of at least two nutrient components, the method further comprising the step of generating a set of ration data based upon variation data representative of a range for at least one nutrient component of the nutrient profile.

27. The method of claim 26, wherein the first and second feed data include an amount for each feed ingredient.

28. The system of claim 27, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

29. The system of claim 27, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

30. A method for determining customized feed for at least one animal, the method comprising:
storing animal data representative of the characteristics of the animal;
storing feed data representative of the feed ingredients located at at least one location;
storing evaluation data representative of at least two evaluation criteria;
generating profile data representative of a nutrient profile for the animal based upon the animal data; and
generating ration data representative of a combination of ingredients from the location, the ration data being generated based upon the profile data, the feed data and the evaluation data, wherein the nutrient profile data is representative of at least two nutrient components of the nutrient profile, and the method generates a set of ration data based upon variation data representative of a range for at least one nutrient component.

31. The method of claim 30, wherein the feed data include an amount for each feed ingredient.

32. The method of claim 31, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

33. The method of claim 31, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

34. A customized feed for an animal, the feed produced by a process comprising:
storing animal data representative of the characteristics of the animal;
storing first feed data representative of the feed ingredients located at a first location;
storing second feed data representative of the feed ingredients located at a second location;
storing evaluation data representative of at least one evaluation criteria;
generating nutrient profile data representative of a nutrient profile for the animal based upon the animal data;
generating first ration data representative of a combination of ingredients from the first location and second ration data representative of a combination of ingredients from the second location, each ration data being generated based upon the profile data, the first or second feed data, respectively, and the evaluation data; and
generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile, wherein the nutrient profile data is representative of at least two nutrient components.

35. The process of claim 34, further comprising mixing the combination of ingredients and feeding the feed to the livestock.

36. A customized feed for livestock, the feed produced by a process comprising:
storing animal data representative of the characteristics of the animal;
storing feed data representative of the feed ingredients located in at least one location;
storing evaluation data representative of at least two evaluation criteria;

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating ration data representative of a combination of the feed ingredients, the ration data being generated based upon the profile data, the feed data and the evaluation data,

wherein the nutrient profile data is representative of at least two nutrient components; and the process further comprises the step of generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile.

37. A food product from an animal fed a customized feed, the food product produced by a process comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first location;

storing second feed data representative of the feed ingredients located at a second location;

storing evaluation data representative of at least one evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data;

generating ration data representative of a combination of ingredients from the first and second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data;

mixing the combination of ingredients to produce the customized feed;

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CERTIFICATE OF CORRECTION

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DATED : January 27, 2004
INVENTOR(S) : Steven R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15 (cont'd),

feeding the customized feed to the animal; and

processing the animal to generate said food product, wherein the nutrient profile data is representative of at least two nutrient components, the process further comprising the step of generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile.

38. A food product from an animal fed a customized feed, the food product produced by a process comprising:

storing animal data representative of the characteristics of the animal;

storing feed data representative of the feed ingredients located at at least first and second locations;

storing evaluation data representative of at least two evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data;

generating ration data representative of a combination of ingredients from the at least first and second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data;

mixing the combination of ingredients to produce the customized feed;

feeding the customized feed to the animal; and

processing the animal to generate said food product, wherein the nutrient profile data is representative of at least two nutrient components, the process further comprising the step of generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile.

Signed and Sealed this

Seventeenth Day of August, 2004

JON W. DUDAS
Acting Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 5,
Table 1, please insert the following indents:

Animal Category	Genotype (lean gain)
Finisher	Effective Ambient Temperature
Gilt Replacement	Temperature
Grow	Draft
Prebred	Bedding
Sow	% of pigs that are wet)
Gestation	Pigs per pen
Lactation	Pig density (square feet per pig)
Begin Weight	Health
End Weight	Flooring Type
Feed Disappearance (Intake)	Total pigs born/litter
Feed Wastage	Litter weight gain
Feed Form	Total pigs born/litter

Column 7,
Table 4, please replace "Vit B" with -- Vit E --.

Column 10,
Table 7, please replace "Lt Barley" with -- Lt. Barley --.

Column 13,
Table 6, please insert appropriate indents to indicate continuation of the previous ingredient:

Acidulated Soap
Stocks

Molasses Standard
Beet

Molasses Standard
Cane

Monosodium Glutamate

Monosodium Phosphate

Mustard Meal High Fat

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13 (cont'd),
Table 6, please replace "Corn/sugar Blend" with -- Corn/Sugar Blend --.

Column 14,
Table 6, please insert the appropriate indents to indicate continuation of the previous ingredient:

Wheat Noodles Low Fat

Standard Micro Premix

Column 17,
Line 1, claim 20 should read:

20. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing first feed data representative of the feed ingredients located at a first location;

third memory means for storing second feed data representative of the feed ingredients located at a second location;

fourth memory means for storing evaluation data representative of at least one evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, the processing means generating ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the processing means based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes fifth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile and the processor means generating a set of ration data based upon the variation data.

Line 5, claim 21 should read:

21. The system of claim 20, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 17 (cont'd),
Line 10, claim 22 should read:

22. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing feed data representative of the feed ingredients located at at least one location;

third memory for storing evaluation data representative of at least two evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, processing means further generating ration data representative of a combination of ingredients from the location, the ration data being generated by the processing means based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain; and

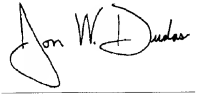
a fourth memory means for storing optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the processing means further generating the ration data based upon the optimization weighting data.

Line 18, claim 23 should read:

23. The system of claim 22, wherein the animal data is representative of at least one of a beginning weigth of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

Signed and Sealed this

Fourth Day of January, 2005



JON W. DUDAS
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 5,
Table 1, please insert the following indents:

-- Animal Category
Finisher
Gilt Replacement
Grow
Prebred
Sow
Gestation
Lactation
Begin Weight
End Weight
Feed Disappearance (Intake)
Feed Wastage
Feed Form
Genotype (lean gain)
Effective Ambient Temperature
Temperature
Draft
Bedding
% of pigs that are wet)
Pigs per pen
Pig density (square feet per pig)
Health
Flooring Type
Total pigs born/litter
Litter weight gain
Total pigs born/litter --.

Column 7,
Table 4, please replace "Vit B" with -- Vit E --.

Column 10,
Table 7, please replace "Lt Barley" with -- Lt. Barley --.

Column 13,
Table 6, please insert appropriate indents to indicate continuation of the previous ingredient: -- Acidulated Soap
Stocks

Molasses Standard
Beet

Molasses Standard
Cane

Monosodium Gluta-
mate

Monosodium Phos-
phate

Mustard Meal High
Fat --.

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 13 (cont'd),
Table 6, please replace "Corn/sugar Blend" with -- Corn/Sugar Blend --.

Column 14,
Table 6, please insert the appropriate indents to indicate continuation of the previous ingredient:

-- Wheat Noodles Low Fat

Standard Micro Premix --.

Column 15, line 15 through Column 20, line 10,
Claims 1-38 should read:

1. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store first feed data representative of the feed ingredients located at a first location;

a third memory portion configured to store second feed data representative of the feed ingredients located at a second location;

a fourth memory portion configured to store evaluation data representative of at least one evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate nutrient profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the data processing circuit based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the evaluation data is representative of at least two evaluation criteria; and

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

a fifth memory portion in communication with the data processing circuit, the fifth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

2. The system of claim 1, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal.

3. The system of claim 2, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

4. The system of claim 1, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

5. The system of claim 1, wherein the memory portions are portions of a digital memory and a parallel data bus is coupled between the digital memory and the data processing circuit to facilitate communication therebetween.

6. The system of claim 1, wherein the memory portions are portions of a plurality of digital memories and a network couples the digital memories to the data processing circuit to facilitate communication therebetween.

7. The system of claim 1, wherein the first and second feed data include an amount for each feed ingredient.

8. The system of claim 7, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

9. The system of claim 7, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

10. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the charaeteristics of the animal;

a second memory portion configured to store first feed data representative of the feed ingredients located at a first location;

a third memory portion configured to store second feed data representative of the feed ingredients located at a second location;

a fourth memory portion configured to store evaluation data representative of at least one evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate nutrient profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the data processing circuit based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fifth memory portion in communication with the digital processor, the fifth memory portion storing variation data representative of a range for the nutrient components of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

11. The system of claim 10, wherein the at least one nutrient component includes at least one of digestible lysine and net energy.

12. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

a second memory portion configured to store feed data representative of the feed ingredients located at at least one location;

a third memory portion configured to store evaluation data representative of at least two evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the location, the ration data being generated by the data processing circuit based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain; and

a fourth memory portion in communication with the data processing circuit, the fourth memory portion being configured to store optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the data processing circuit further generating the ration data based upon the optimization weighting data.

13. The system of claim 12, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

14. The system of claim 12, wherein the optimization weighting data may be selected to cause one of the evaluation criteria to have no effect on the generation of the ration data.

15. The system of claim 12, wherein the feed data include an amount for each feed ingredient.

16. The system of claim 15, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

17. The system of claim 15, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

18. A system for determining customized feed for at least one animal, the system comprising:

a first memory portion configured to store animal data representative of the characteristics of the animal;

a second memory portion configured to store feed data representative of the feed ingredients located at at least one location;

a third memory portion configured to store evaluation data representative of at least two evaluation criteria;

a data processing circuit in communication with the memory portions and configured to generate profile data representative of a nutrient profile for the animal based upon the animal data, the data processing circuit being further configured to generate ration data representative of a combination of ingredients from the location, the ration data being generated by the data processing circuit based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) cost of feed per unit animal weight gain, and (iii) feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fourth memory portion in communication with the digital processor, the fourth memory portion storing variation data representative of a range for at least one nutrient component of the nutrient profile and the digital processor generates a set of ration data based upon the variation data.

19. The system of claim 18, wherein the at least one nutrient component includes at least one of digestible lysine and net energy.

20. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

second memory means for storing first feed data representative of the feed ingredients located at a first location;

third memory means for storing second feed data representative of the feed ingredients located at a second location;

fourth memory means for storing evaluation data representative of at least one evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, the processing means generating ration data representative of a combination of ingredients from the first and second locations, the ration data being generated by the processing means based upon the profile data, the first and second feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes fifth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile and the processor means generating a set of ration data based upon the variation data.

21. The system of claim 20, wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

22. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing feed data representative of the feed ingredients located at at least one location;

third memory for storing evaluation data representative of at least two evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, processing means further generating ration data representative of a combination of ingredients from the location, the ration data

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,
being generated by the processing means based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain; and

a fourth memory means for storing optimization weighting data representative of the effect a respective evaluation criteria has on the generation of the ration data, the processing means further generating the ration data based upon the optimization weighting data.

23. The system of claim 22, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source.

24. The system of claim 23, wherein the evaluation criteria include at least two of (i) animal production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain.

25. A system for determining customized feed for at least one animal, the system comprising:

first memory means for storing animal data representative of the characteristics of the animal;

second memory means for storing feed data representative of the feed ingredients located at at least one location;

third memory for storing evaluation data representative of at least two evaluation criteria;

processing means for generating profile data representative of a nutrient profile for the animal based upon the animal data, processing means further generating ration data representative of a combination of ingredients from the location, the ration data being generated by the processing means based upon the profile data, the feed data and the evaluation data, wherein the evaluation criteria include at least one of (i) animal

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,
production rate, (ii) the cost of feed per unit animal weight gain, and (iii) the feed weight per unit animal weight gain, wherein the animal data is representative of at least one of a beginning weight of the animal; a desired weight of the animal; an environment of the animal; a feed form; an actual or desired production level of the animal; and a relationship of animal muscle to fat of the animal; and wherein the feed ingredients include at least one of a grain source, a protein source, a vitamin source, a mineral source and a fat source, wherein the nutrient profile data is representative of at least two nutrient components, and the system further includes a fourth memory means for storing variation data representative of a range for at least one nutrient component of the nutrient profile; and the processing means generates a set of ration data based upon the variation data.

26. A method for determining customized feed for at least one animal, the method comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first loeation;

storing second feed data representative of the feed ingredients located at a second location;

storing evaluation data representative of at least one evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating first ration data representative of a combination of ingredients from the first location, second ration data representative of a combination of ingredients from the second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data, wherein the nutrient profile data is representative of at least two nutrient components, the method further comprising the step of generating a set of ration data based upon variation data representative of a range for at least one nutrient component of the nutrient profile.

27. The method of claim 26, wherein the first and second feed data include an amount for each feed ingredient.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

28. The method of claim 27, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

29. The method of claim 27, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

30. A method for determining customized feed for at least one animal, the method comprising:

storing animal data representative of the characteristics of the animal;

storing feed data representative of the feed ingredients located at at least one location;

storing evaluation data representative of at least two evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating ration data representative of a combination of ingredients from the location, the ration data being generated based upon the profile data, the feed data and the evaluation data, wherein the nutrient profile data is representative of at least two nutrient components of the nutrient profile, and the method generates a set of ration data based upon variation data representative of a range for at least one nutrient component.

31. The method of claim 30, wherein the feed data include an amount for each feed ingredient.

32. The method of claim 31, wherein the amount for each feed ingredient can be constrained according to one or more criteria.

33. The method of claim 31, wherein the amount of each feed ingredient can be constrained according to at least two criteria.

34. A customized feed for an animal, the feed produced by a process comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first location;

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

storing seeond fced data representative of the feed ingredients located at a second loeation;

storing evaluation data representative of at least one evaluation criteria;

generating nutrient profile data representativc of a nutrient profile for the animal based upon the animal data;

generating first ration data representative of a combination of ingredients from the first location and seeond ration data representative of a combination of ingredients from the second location, each ration data being generated based upon the profile data, the first or second feed data, respeetively, and the evaluation data; and

generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile, wherein the nutrient profile data is representative of at least two nutrient components.

35. The proeess of claim 34, further comprising mixing the combination of ingredients and feeding the feed to the livestoek.

36. A customized feed for livestock, the feed produced by a process comprising:

storing animal data representative of the charaeteristies of the animal;

storing feed data representative of the feed ingredients loeated in at least one location;

storing evaluation data representative of at least two evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data; and

generating ration data representative of a combination of the feed ingredients, the ration data being generated based upon the profile data, the feed data and the evaluation data,

wherein the nutrient profile data is representative of at least two nutrient components; and the process further eomprises the step of generating a set of ration data based upon variation representative of a range for the nutrient eomponents of the nutrient profile.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

37. A food product from an animal fed a customized feed, the food product produced by a process comprising:

storing animal data representative of the characteristics of the animal;

storing first feed data representative of the feed ingredients located at a first location;

storing second feed data representative of the feed ingredients located at a second location;

storing evaluation data representative of at least one evaluation criteria;

generating profile data representative of a nutrient profile for the animal based upon the animal data;

generating ration data representative of a combination of ingredients from the first and second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data;

mixing the combination of ingredients to produce the customized feed;

feeding the customized feed to the animal; and

processing the animal to generate said food product, wherein the nutrient profile data is representative of at least two nutrient components, the process further comprising the step of generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile.

38. A food product from an animal fed a customized feed, the food product produced by a process comprising:

storing animal data representative of the characteristics of the animal;

storing feed data representative of the feed ingredients located at at least first and second locations;

storing evaluation data representative of at least two evaluation criteria;

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,681,717 B2
DATED : January 27, 2004
INVENTOR(S) : Steve R. Burghardi et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 15, line 15 through Column 20, line 10,

generating profile data representative of a nutrient profile for the animal based upon the animal data;

generating ration data representative of a combination of ingredients from the at least first and second locations, the ration data being generated based upon the profile data, the first and second feed data and the evaluation data;

mixing the combination of ingredients to produce the customized feed;

feeding the customized feed to the animal; and

processing the animal to generate said food product, wherein the nutrient profile data is representative of at least two nutrient components, the process further comprising the step of generating a set of ration data based upon variation data representative of a range for the nutrient components of the nutrient profile.

This certificate supersedes Certificate of Correction issued August 17, 2004 and January 4, 2005.

Signed and Sealed this

Eleventh Day of October, 2005

JON W. DUDAS
Director of the United States Patent and Trademark Office